

THE IRON AGE

THURSDAY, JULY 7, 1892.

The Lincoln Stone-Planing Machine.

The engraving on this page represents a machine recently designed and constructed by the Lincoln Iron Works of Rutland, Vt., for planing marble, blue-stone, sandstone, &c., for building purposes. The machine was designed for the Government work at Sault Ste. Marie, Mich. It is intended to perform a large part of the cutting usually done by hand, and to do the work in a much shorter time and at considerably less expense. As will be noticed, it is made with two complete sets of posts, cross heads and other attendant parts. These are placed as near together as possible and allow the operator room between them. This feature makes the machine almost a continuous cutter, and two sets of tools enable the operator to reverse the platen before either set reaches the end of the stone, thus preventing chipping off the corners, which would occur should the tool pass over the edge at either end. No trouble has been found in planing both plane surfaces and moldings,

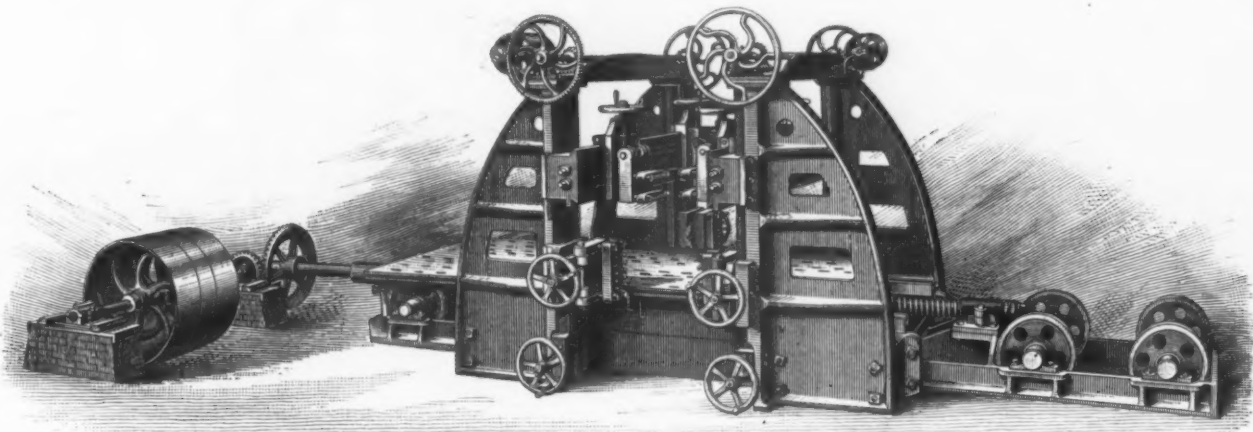
with a square thread of $1\frac{1}{2}$ inches pitch. All other screws are of steel and all sliding parts are accurately fitted, and, where necessary, are provided with gibs for taking up the wear.

A New Feature in Elevating and Conveying Machinery.

To the various manufacturing interests of this country, this subject has of late years been one of vital importance. The excessive cost of operating as compared with advantages over former methods has always been a great objection in the matter of economical coal handling by the railroad corporations; in rapid and inexpensive appliances for the handling of the different ores by the mining interests; with pulp manufacturers, in carrying their pulp wood from water or cars to piling ground and chippers, and in elevating of chips and conveying same to their screens and hoppers; with the lumber and saw-mill industries, the hauling of their logs

can be operated. In the transmission of power, the transmitting clamps, being spaced upon the cable at intervals to correspond with the gaps in the wheels, give a positive motion. The company have several of these power transmissions operating with satisfaction.

For the elevating of hard, soft and pebble phosphate rock, burnt cement, ores, broken stone, lump sulphur, pyrites and other coarse material, their double-strand centrally hung bucket elevator, Fig. 1, is specially adapted. The pebble phosphate rock as it comes from the mines in cars to be washed or freed from the clay and sand, the contents of the car being flushed from it into the pit or hopper at the foot of elevator, is there received by the buckets and elevated to the washer above. The flow of water used in freeing the car from its contents separates or loosens the clay, sand, &c., with which the rock is mixed, and this material being agitated by the buckets in elevating, is more rapidly and thoroughly cleansed on entering the washer, and consequently more carloads per day can be washed, and



THE LINCOLN DOUBLE-HEAD STONE-PLANING MACHINE.

as the two sets of tools can be so adjusted as to conform to the same molding, one set being a reverse of the other. The machine is driven by a screw and bevel gearing, as in the single head planer built by the same company; but instead of friction wheels two belts are used, an open and a crossed. These shift alternately from loose pulleys on to the fast or driving pulley, which is in the middle, and, as the machine cuts in both directions, both belts will run from the same size pulley on the driving shaft.

For planing marble or bluestone no tool stock is placed on the posts, but two on each cross head; these are made to swivel so they can be set at an angle, and either tool stock can be traversed across the machine from either side.

The cross heads are both provided with power raising gear, but can be raised by hand if necessary.

The machine will plane 6 feet and 6 inches wide between the posts, 3 feet high and 12 feet long, and the platen is driven in both directions at a speed of 25 feet per minute. The platen runs in ways when under the tools, but over friction wheels after passing the tools; it is 144 inches long, 66 inches wide and 24 inches thick, and weighs in the rough about 10,000 pounds.

The main screw is 5 inches diameter and

from the water, and conveying the refuse to burners or dumping place; with the Florida phosphate miners, in the handling of their hard, soft and pebble phosphates; and with tanners for long distance conveying of bark, ground and spent tan, and the numerous other industries in which this class of machinery takes an important part. It is stated that this objection is being overcome by the new system of steel cable machinery now being extensively introduced by the Steel Cable Engineering Company of Boston, Mass., with marked success. Of the many advantages claimed for this system over former methods, may be mentioned the decreased amount of power required for operating, the longer distance material can be conveyed, and distribution over a larger area, conveyors being capable of arrangement at an incline or any angle ordinarily required; greater simplicity and strength and less liability to excessive wear. With this system power can be applied at either receiving or discharging end, without in any manner affecting the operation of the conveyor. The sprocket cable wheels are so designed that they can be reversed when the parts coming in contact with the steel cable have become worn, thus giving an entirely new wearing surface. The wearing surface being chilled adds considerably to the length of time these wheels

with better results in the condition of the rock for drying, than can be effected with other methods. This form of elevator is more serviceable in elevating broken stone and ores from the crusher, as it has fewer wearing parts exposed to the action of the dust and cutting particles formed by crushing the material, and, at the same time, allows the screen countershaft at top to be driven from the elevator head shaft. In cases where power is applied at the foot of the elevator from the crusher driving shaft, the steel cables not only do their work in elevating the material, but carry the power with them to the elevator head shaft.

In connection with crushing appliances where other form of bucket elevators have proved ineffectual, the single-strand steel cable elevator, Fig. 2, is found to be durable and effective, working satisfactorily with either malleable iron or steel buckets. An important factor in many instances is that this elevator works perfectly driven from the boot or foot, as the cable has no tendency to buckle or gather at the foot wheel, as is the case with chain, all undue strain upon the boot being avoided. Various diameters of cable may be used, according to the distance between centers, nature of material to be elevated, or other requirements. Where used in elevating chips to the screens above from

the chippers it is very easily operated, being light and strong, and the long slivers do not adhere to it or wedge at the head wheel. As there are no joints to

iron and steel plants are affecting and influencing other trades, it may be mentioned that some weeks ago a Ridgway crane was put in one of the vegetable and oyster

noiselessly and easily, and made such a wonderful saving in labor, that nearly all the leading packers in that city have decided to adopt these cranes, and they will be put in during the present year.

A triple launch took place at the yard of the American Steel Barge Company, in Superior, 25th ult. There were two steamers and a tug for the Sault Ste. Marie Railway Company, the former duplicates of each other, 320 feet long and registering 1572 tons. This addition to the whale-back fleet on the great lakes brings the total carrying capacity of this class of vessels now in service on fresh water to something over 50,000 tons, being 12 tow barges and 8 steamers.

All the east-bound roads have been cited by the Interstate Commerce Commission to appear in the United States District At-

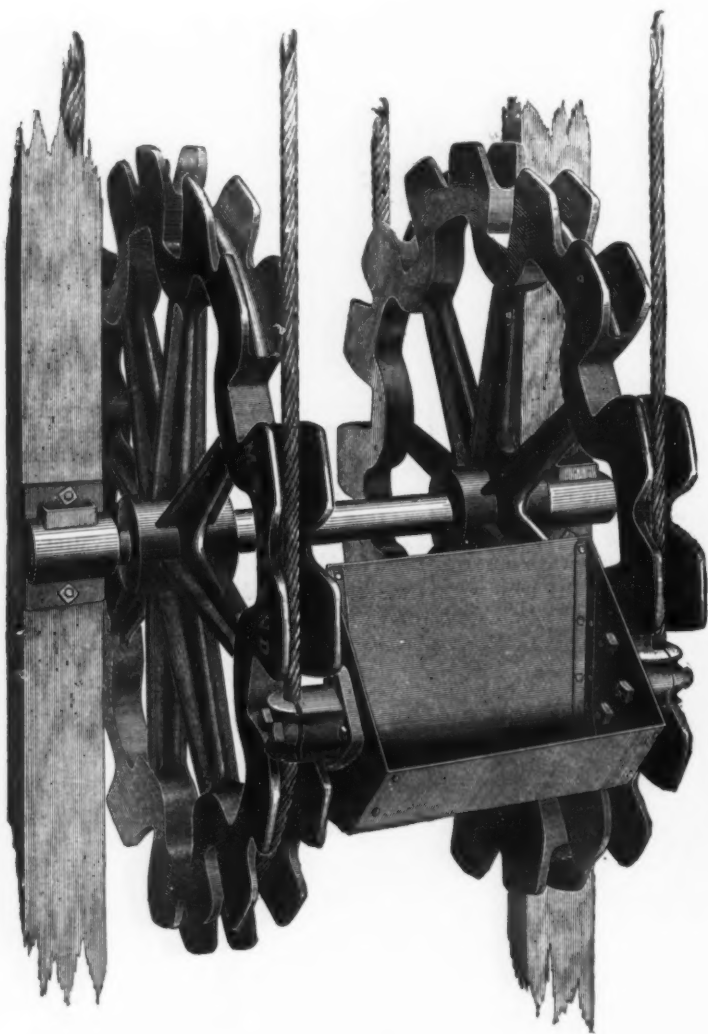


Fig. 1.—Double-Strand Steel Cable Bucket Elevator.



Fig. 2.—Single Strand Steel Cable Elevator.

hold the cutting material in ground cement, phosphate rock, sand or coke, it outwears other forms of elevator, which require a double strand and consequent additional complication of machinery in order to accomplish the same work.

The angle conveyor, Fig. 3, shown in connection with the patented cast-iron tube, can be used in the wooden V-shaped trough with iron linings, as well for spent tan, chips, anthracite and bituminous coal, ground phosphate rock and cement, replacing the screw conveyor found difficult to operate owing to its many necessary bearings and limited capacity corresponding with the power absorbed. The steel cable can be used in the Caldwell conveyor lining, taking the place of the screw, and power can be applied at either discharging or receiving end. The cast-iron tube prevents the conveying attachments from riding over its load, and by inverting a section the material can be deposited at any point through the opening thus formed. The tube being made flaring at top prevents overflow when the conveyor is not uniformly fed, and in a series of continuous conveyors lessens the tendency to setting back of the material. When the conveyor is inclined, the cast-iron tube being made in sections is the more easily removed or replaced, and is made correspondingly heavy where wear is most likely to occur.

As an indication of how the rapid appliances for handling heavy weights quickly and economically used in modern

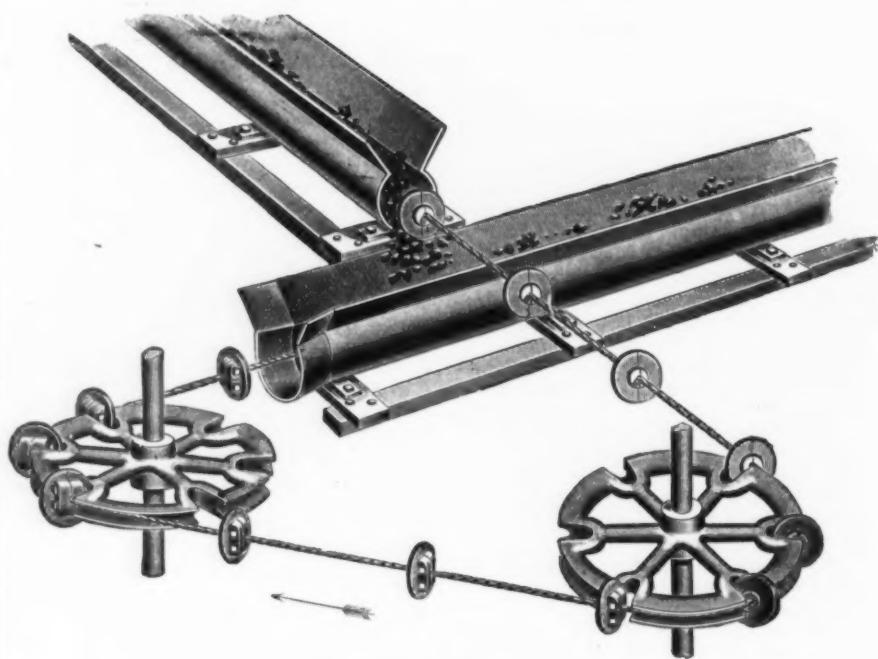


Fig. 3.—Angle Conveyor.

A NEW FEATURE IN ELEVATING AND CONVEYING MACHINERY.

canning establishments in Baltimore for hoisting the crates of vegetables in and out the boiling kettles. This crane did this heretofore unpleasant work so quickly,

torney's office at Chicago on July 13, where an inquiry into rate cutting will begin. The weak lines have been getting the bulk of the traffic for 60 days.

Turret Lathe.

In getting up this lathe (which is built by the Windsor Machine Company of Windsor, Vt., and for which patents have been applied), the designer, H. H. Mercer, has endeavored to produce a tool that shall be easy and quick to operate, and at the same time possess sufficient strength to resist the severest strain. To accomplish this end something of a departure has been made from the general manner of constructing turret machinery. The bed and legs, however, are of the usual style, a cabinet leg being provided if desired, but the spindle head and turret mechanism are built on a new plan possessing many points of claimed superiority over the usual mode of construction.

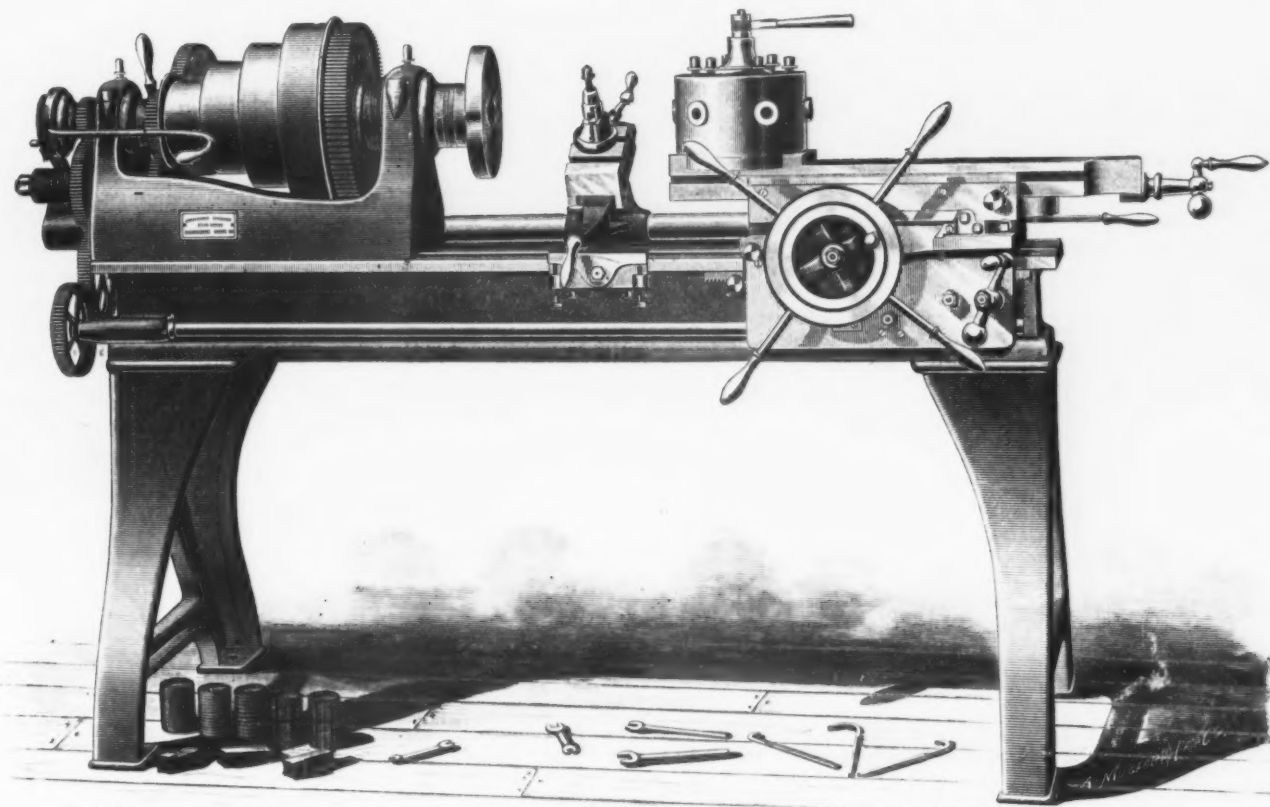
Attention is first called to the new back

so great within the cone that but little force is required to engage or disengage the frictions. The two toggle joints are placed at opposite sides of the spindle, thereby balancing the whole revolving mechanism of the spindle. Means easy of access are provided for taking up the wear of the frictions, but this is small since the friction rings are wide and of large diameter and so made that each part can be readily oiled. At the left of the head is shown gearing for giving motion to the feed rod seen at the front of the machine, and also for operating the chaser which is for cutting either inside or outside threads and at any angle parties may desire.

The turret and the parts supporting it are designed to withstand severe usage. The base is heavy and has a long bearing on the ways of the bed which are broad

of the operator. For facing up work a cross-feed motion is provided having a long run and operated by the hand wheel shown within the star wheel at the front of the machine. The holes in the turret are steel bushed and are, as well as the spindle hole, bored any desired size. Taper gibs are provided for taking up wear and keeping the tool in perfect alignment. The wearing surfaces are scraped to a bearing and all parts subject to severe wear are hardened and ground. Automatic stops are provided so that duplicate work can be turned out with accuracy and rapidity.

It will readily be seen that by having two feeds entirely independent of each other, certain kinds of work, requiring a straight and also a taper cut to be taken on the same piece, can be done on this tool by power or hand feed, and without in any



THE MERCER TURRET LATHE.

geared friction head. By an examination of the cut it will be seen that there is no space between the pulley and the face gear as is generally the case in friction or clutch back geared heads, and only the usual space between the gear and that part of the head casting supporting the larger bearing. Quite a little space is thereby gained and this is added to the spindle belt width so that on the larger machine a 4½-inch belt is used. The cone is proportionately large in diameter and within this cone is the friction, a positive grip, yet producing no shock when thrown in or out even if the machine is running at a high rate of speed. Two wide friction rings are supported on a thick disk having a large nut splined to the spindle. These rings are expanded by two toggle joints receiving their motion from wedges operated by the curved lever seen at the front of the machine. The spindle cone as well as the face gear runs free on the spindle, each having a friction surface for engagement with the expanding rings. That part of the gear engaged by the slow running ring extends under the large lift of the cone, thus getting a wider friction surface and at the same time a longer bearing on the spindle. The leverage is

and planed at an angle of 45°. To this base is fastened a feed apron, and within this apron and driven by a worm running in oil is the gearing giving a backward and forward feed motion to the turret, so that a cut can be taken by power feed in either direction, to or from the chuck holding the work. This feed is for taper work, the turret swiveling to any desired angle and being firmly locked in that position by the lever seen at the right and under the slider. Straight cuts can also be taken by means of this feed, but a separate feed is provided, more particularly for straight work such as chucking and other heavy cuts. A screw is also provided in the tail end of the turret slide and for certain kinds of work this will be found useful, but for most purposes where a hand feed is wanted the star wheel will be found the quickest to operate. For a powerful straight feed along the ways of the machine the entire turret mechanism is fed by means of a screw within the bed and directly under the tool where comes the greatest strain when the machine is working. This feed can also be operated by hand if necessary, and when so worked or driven by power it drives the whole turret mechanism in either direction at the will

way resetting the machine. This tool is made in three sizes, 16, 18½ and 21 inch swing respectively. Some of the most important dimensions of the largest machine are: The bed is 7½ feet in length, and on this the entire turret mechanism has a run from the chuck to the tail end of the bed. The turret slide has a feed of 12 inches and work 9 inches in diameter can be squared up. A 4½-inch belt is used, the largest lift of the cone being 14 inches diameter. The general agents for this machine are the Prentiss Tool & Supply Company of New York.

The American ocean greyhounds for the International Navigation Company, to run as consorts with the City of Paris, will soon be ordered, the models and designs of machinery having been substantially agreed upon.

The Yarmouth ship *Fred. B. Taylor* was cut in two as by a knife by the German steamer *Trave*. The incident shows that a vessel steaming at high speed through a fog stands less risk of damage to herself, in case of collision, than she would incur in going at a greatly reduced speed.

FIRE-PROOF CONSTRUCTION.

(Concluded from page 1271, June 30.)

Fire-Proof Floor, Ceiling and Partition Walls.

Fig. 11 shows a floor and ceiling construction suitable for all classes of buildings, from those requiring only efficient

protection against fire to those not only requiring protection, but great strength of floor construction. A load of from 70 to 140 pounds per square foot, with a factor of safety of 6, can be carried in spans of 6 feet between center of beams. The weight of the rods, wire lathing and concrete forming the floor will be from 23 to 33 pounds per square foot, or from 33 to 43 pounds per square foot represents the

whole of the fixed load with the exception of the wood floor and partitions carried by the beams. The basis of this floor construction is a series of rods hooked over the flanges of the beams, or attached to them by clips designed for that purpose. The rods are placed 12 inches apart (or more or less as the case may require), and over them are spread sheets of wire lathing, running parallel with them and over

Fig. 11.—Floor and Ceiling Construction.

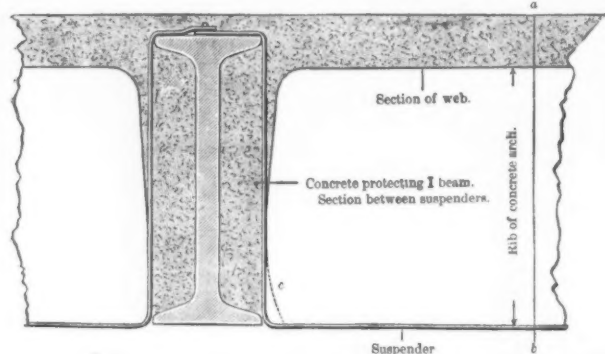
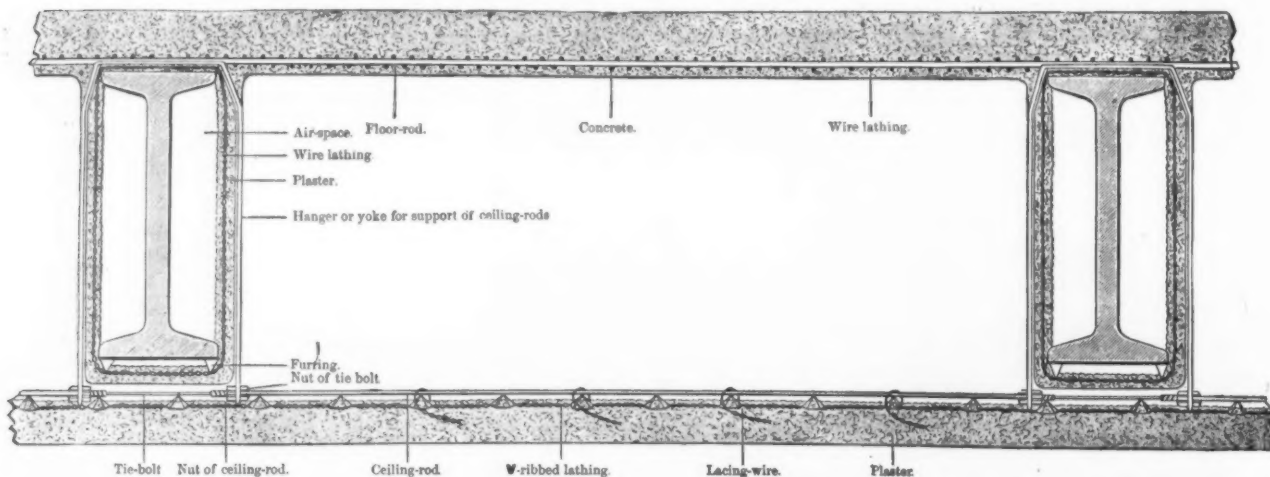


Fig. 12.—Concrete Arch Construction.

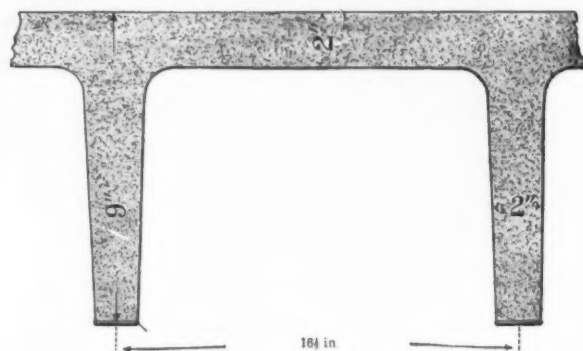


Fig. 13.—Section through a b of Fig. 12.

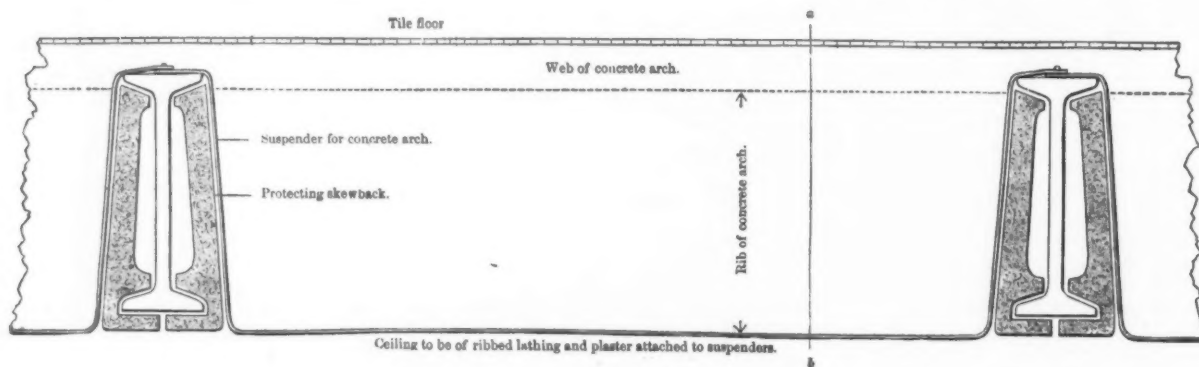


Fig. 14.—I-Beams Protected by Skewbacks.

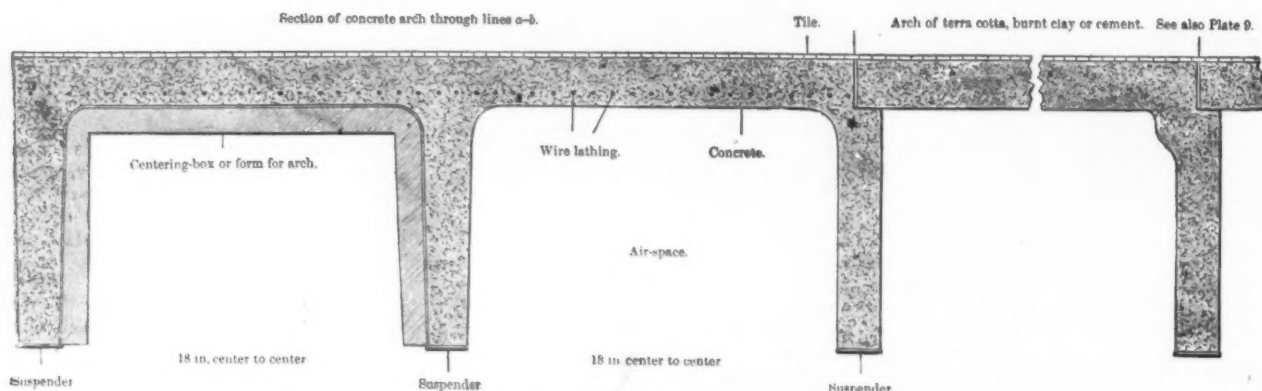


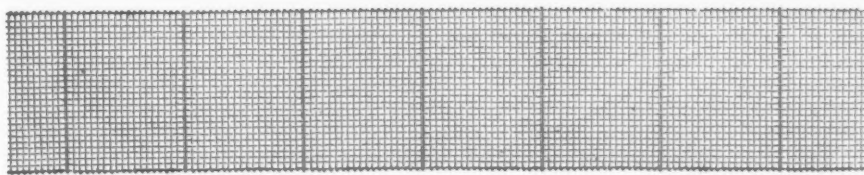
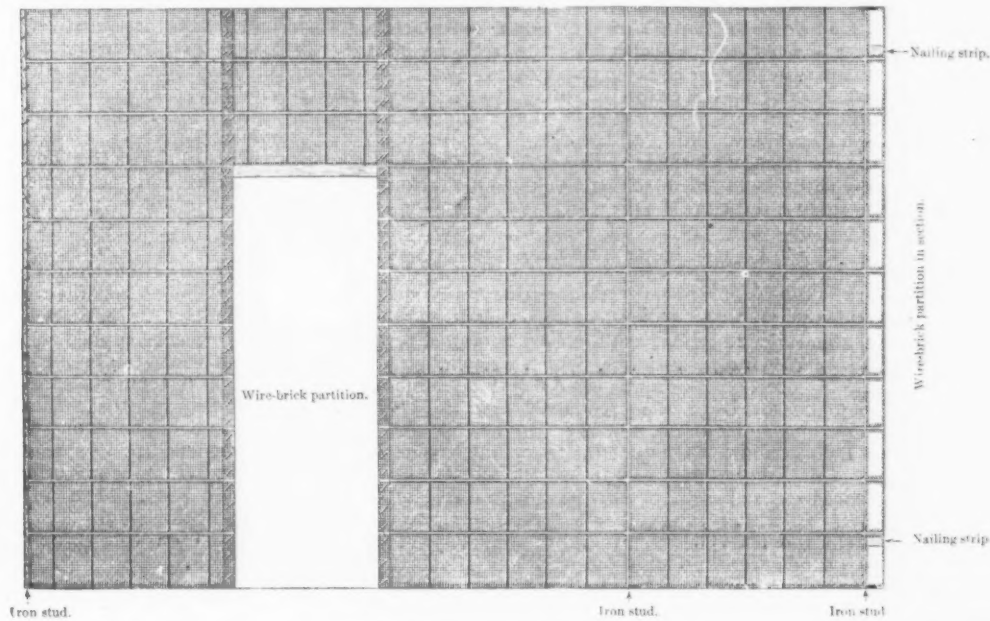
Fig. 15.—Section of Fig. 14

FIRE-PROOF CONSTRUCTION.

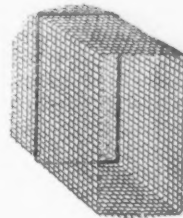
the top of the beams. The concrete is then spread on from above to a depth of 2 to 3 inches. No centering will be required, as the cross meshes of the lathing will be so close together that only enough concrete

are from $\frac{5}{16}$ to $\frac{7}{16}$ inch in diameter, with tensile strength of from 5000 to 8000 pounds each, and the combined tensile strength of the lateral wires in the lathing would add from 30 to 60 per cent. to this

should be greater than the estimated crushing strength of the concrete at center of arch, for, if the former fails, the whole will fall, but if the concrete crushes the leverage on the rods and wire will be to a

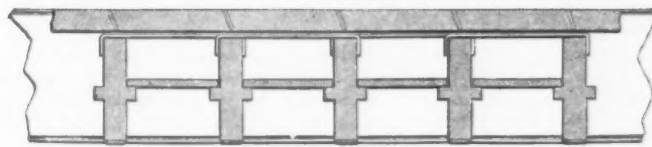
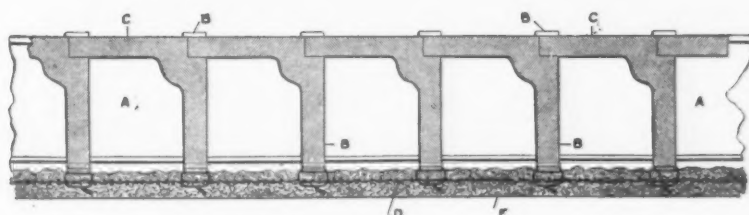
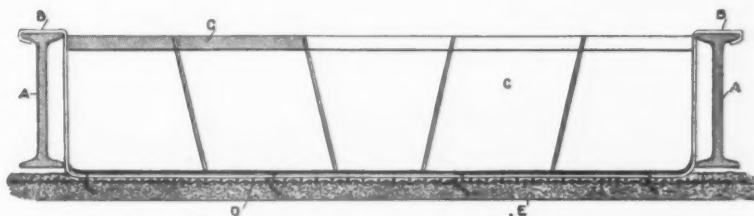
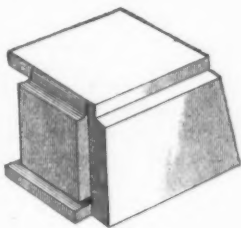
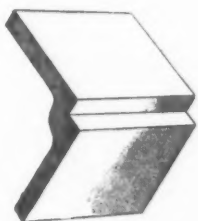


Wire brick & size.



End of wire brick

Figs. 16, 17, 18.—Wire Partition Bricks.



Figs. 19 to 24.—Suspended Floor and Ceiling.

FIRE-PROOF CONSTRUCTION.

will go through to firmly anchor the wire. After the concrete is set the under side may, if required, be smoothed off and the wires and rods entirely embedded by applying a single coat of cement or plaster.

The rods used in spans of $4\frac{1}{2}$ to 6 feet

strength. For wider spans than above and for same floor loads it is only necessary to increase the size of rods, to use larger wires in lathing, and to increase slightly the thickness of concrete. In all cases, the tensile strength of the rods and wire

great extent removed, and they would be capable of holding an increased load; so that, although load enough were put on the floor to crush the concrete, it would be held suspended by the rods and lathing without any injury to the ceiling.

Three slabs recently constructed, as shown in Fig. 11, were tested to find their carrying capacity. The I-beams were 6 feet on center, and the concrete 2 feet wide by 3 inches thick at center, and 2 inches thick over the beams, making an average of $2\frac{1}{2}$ inches of thickness for the slabs. The concrete, which was 1 of cement to $2\frac{1}{2}$ of common sand, was supported by three $\frac{5}{8}$ -inch rods hooked over the flange of one beam and attached to the other by clips, and by a web of wire lathing attached to the rods and bent around the outer flanges of the beams as an anchorage, the netting answering the double purpose of a centering for the concrete and a bond for the bottom of the slabs. In five days it was begun to weight one of the slabs, and put on a distributed load of 1750 pounds in plates of zinc. This caused a deflection of $\frac{3}{8}$ inch at center of slab. In 24 hours 350 pounds were added with no further deflection. After standing 24 hours 350 pounds additional weight was put on, causing a deflection of $\frac{1}{8}$ more, or $\frac{1}{2}$. The next day 350 pounds added weight added $\frac{1}{8}$ more to the deflection. The tenth day we added 1400 pounds, making in all 4200 pounds. This weight crushed the concrete and allowed the slab to deflect $1\frac{1}{2}$ inches at center, at which point the rods and lathing held the mass suspended for 24 hours; 700 pounds were then added, causing a further deflection of $\frac{5}{8}$ inch. The addition of 350 pounds, or a total load of 5250 pounds, broke one of the rods at the hook, broke one of the clips, and straightened the hook of the third rod, drew the lathing from its anchorage and dropped the load. The second slab gave very nearly the same results as the first.

Slab three was the same as the others, with the exception of the supporting rods, which were $\frac{7}{8}$ instead of $\frac{5}{8}$. It was expected this would carry about twice the load of the others, not anticipating that the clips would prove the weakest part of the construction, and, as was shown, insufficient in strength even for the light rods. A load of 1750 pounds was placed on this slab in 17 days after being made, causing it to deflect $\frac{3}{8}$ inch at center. In 24 hours the load was increased to 2800 pounds, giving slab a deflection of $\frac{1}{2}$. Twenty-four hours later we increased the load to 4200 pounds, which caused a deflection of $\frac{1}{2}$, after which, on increasing the load to 5250 pounds, the slab settled from $\frac{1}{2}$ inch to $\frac{3}{4}$ inch deflection in 30 minutes, and 10 minutes later the concrete crushed, but was held suspended by the rods till 350 pounds more were added, breaking all the clips. These tests, and others made at various times, with very much the same results, go to show that a load is so well distributed over the wires imbedded in the concrete that from about one half to nearly their full tensile strength can be depended on according to the width of the span.

In Fig. 11 is also shown a method for the protection of the iron beams. They are covered with wire lathing, which is drawn around them and laced together at the top of the beams. At the bottom of the beams is an offset by ribs of thin steel, which gives the mortar a chance to clinch around the wires, and also leaves an air space between the mortar and the beam. This gives a very efficient protection, as mortar clinched through the meshes of wire lathing will not burn or fall off and an air space is left around the beam where the greatest protection is required. A very heavy coat of mortar will be held safely by the wire lathing.

The system shown in Fig. 11 is also applicable to mill construction. The wood beams can be incased in the wire lathing, which will be offset from the beams at the sides in a manner similar to the offset at the bottom. This will leave an air space around the beams and avoid the very

serious risk of dry rot, which would be apt to take place were the beams closely imbedded in the plaster.

Concrete Arch Construction.

Figs. 12 and 13 show concrete arch construction. These arches are built up over formers suspended on the lower flanges of the beams, and placed between the suspender irons upon which the ribs of the concrete arches rest. The cement or concrete is mixed to the proper consistency, and applied and tamped into place, filling all the spaces not taken up by the formers. The ribs and the web may be made of any thickness of section required. As the greatest pressure comes on the lower corners of the ribs, in proportion to the resisting surface, it would be well to have the concrete at those points of a greater crushing strength than the rest.

An arch of this construction, 18 inches wide, built up on two $\frac{5}{8}$ x $1\frac{1}{2}$ inch iron suspenders, which were hung over 9-inch I-beams, placed 6 feet on centers, the rib of the arch reaching the bottom of the beam, and the top of the web reaching the top of the beam, the concrete having a thickness in section of 2 inches, carried a load of 9000 pounds in zinc plates built up in eight piles, each pile having a space between it and the next adjoining, so that no pile received any support from the neighboring one, the entire weight resting on the concrete, none of it being on the I-beams, for 96 hours, and nearly all this time the weight was under vibration from the jar of heavy engines. With this weight, 9000 pounds, the concrete at the lower left-hand corner showed signs of having reached its limit of crushing strength, and when 700 pounds more had been added it failed, crushing the cement to dotted lines at c, Fig. 12.

The deflection of the arch with 5000 pounds load was $\frac{1}{8}$ inch, and at this time a few fine cracks began to appear along the bottom of the ribs at and near the center of arch. The cracks opened slightly as the load was increased, the worst one showing about $\frac{1}{8}$ inch open at the bottom when the load was 9000 pounds, and the deflection of arch was $\frac{1}{4}$ inch. A cake of zinc weighing 43 pounds dropped from a height of 18 inches on the load at center had no visible effect on the arch. When the cement (at c) crushed with load of 9700 pounds the arch settled at center till there was a deflection of about 2 inches, in which position it was stopped by blocking below. The weight was now removed, and the concrete, when inspected, showed the ribs very badly cracked in both directions, and the web somewhat cracked, but showing no sign of crushing at the top where the crushing stress was most severe. Evidently the suspenders and the web of the concrete arch were capable of supporting considerable more load than was applied. The blocking being removed from below, a 43 pound plate of zinc was dropped on center of arch from a height of $6\frac{1}{2}$ feet 12 times, and 86 pounds from a height of 5 feet once, the 13 blows adding somewhat to the deflection, and opening a little more some of the cracks.

In this condition a load of 2700 pounds, 300 pounds per square foot, was evenly distributed over the arch, and remained 48 hours, after which a load of 1032 pounds was applied at center of arch, the weight covering a space the width by 8 inches of its length. In 48 hours 520 pounds more were added to the same pile, making it equal to a distributed load of 345 pounds for each square foot of surface. The deflection with this load was nearly 4 inches, and the mass was entirely supported by the suspenders, the concrete adding 30 pounds per foot to the weight, but nothing to the strength. While cutting away from below to allow the suspenders more room for deflection as the weight

should be increased, the jar caused one of them to settle before the other was relieved, and the mass of concrete and zinc plates fell sideways out of the suspenders, there being nothing to support the arch in that direction.

Fig. 14 shows the I-beams protected by skewbacks, the suspenders for the floor and ceiling passing over the beams and skewbacks, the concrete arch resting on the suspenders and a tile floor laid on the concrete. The ceiling lathing is the same as in Fig. 11, and applied in the same manner.

Fig. 15 shows the above in section with centering box or former in place in the arch at left of cut; it also shows the suspenders in section and a sheet of wire netting imbedded in the web of the concrete arches to strengthen them between the ribs. The arch at the right of this figure shows how terra cotta, clay or concrete bricks may be applied in this construction. These bricks can be made as shown in section, or in some modification of this form, and they can be made to extend from beam to beam in one piece or in several, as convenient. In spans of 5 feet to 8 feet three, five or more bricks would preferably be used, the central one forming the key to the arch. Tests of arches constructed on this principle showed great strength.

Wire Partition Bricks.

Figs. 16, 17 and 18 illustrate the wire partition bricks. These are made of No. 20 wire lathing, into which, at intervals of 7 or 8 inches, are woven iron rods about $\frac{3}{16}$ inch diameter. The whole is then galvanized so that all the joints are soldered together, and are then bent into the required form. For a 4 inch partition they are made 4 x 10 or 12 x 48 inches. For a 6-inch or 8 inch partition they are 6 or 8 x 12 inches x 5 feet long. Almost any size or length can be made, but it is well to limit the size, at least in length, on account of getting sufficient stiffness for the wall.

The bricks are built up into sections between iron studding. For a 4-inch wall, $\frac{3}{8}$ to $\frac{1}{2}$ x 4 inches is stiff enough, as the strength edgewise is all that is required. The pieces are cut 3 or 4 inches longer than the distance between floors, and the ends are bent at right angles so as to form lugs, by which they are attached to the beams either by screws or by clamp bolts.

Suspended Floor and Ceiling.

Figs. 19 and 20 show very fully the construction of the suspended floor and ceiling when the arches are built of a series of bricks arranged to fill the space between the beams. Fig. 19 is a side elevation of an arch so constructed, A A are the beams, B B the suspenders, C C the concrete, terra cotta, or clay brick of which the arches are constructed, D is the wire lathing imbedded in the plaster E, which makes the ceiling. Ribbed lathing is preferably used on account of its leaving an air space between the plaster and the suspenders, and be ause the suspenders can be placed further apart than if any other kind of metal lath were used, 24 inch to 30 inch spaces being safely carried by it. Fig. 20 is a section of this floor and ceiling at any point between the beams. Like letters indicate like parts as in Fig. 19. Fig. 21 shows one of the bricks in perspective. A groove is made in one of its edges to receive the free edge of the adjoining brick in the next section of arch. The joints should be made in cement to stiffen and solidify the top, or web, of the arches, the better to enable them to carry heavy loads. Fig. 22 is the same as above, except that the bricks are provided with intermediate air spaces between the ceiling and the top of the arches. Fig. 23 shows a method of fire proofing the beams with the end bricks of the

arches. The bricks are molded to fit between the flanges of the beams and around and under the bottom flange. In laying, the end bricks are first set and the key brick is pressed into place to complete the arch. The beams are further protected by the ceiling, which is plastered on wire lathing. Fig. 24 shows a construction where the arches are built up of two series of bricks, one resting on the suspenders for the ribs, and another series laid on top of these for the web of the arch. Projections are shown on the upright bricks, upon which rest intermediate sheets or slabs of fire proofing material. Hoop iron stays are also shown along the top of the rib bricks; these are used to give the top of the ribs the correct spacing; they also serve, when they are bedded in the cement, to unite the whole and to strengthen the top bricks between the ribs. Instead of using two series of bricks, one for the ribs and one for the web or top of the arches, as shown in Fig. 24, the web may be made by placing ribbed lathing over the tops of the rib bricks, the ribs of the lathing resting on the bricks, and then spreading good concrete to a thickness of 1½ to 2 inches over the whole. This would unite the whole very firmly together, and the concrete between the ribs would be so bonded together by the lathing that it would be very difficult to crush it through. A little saving in floor space would be made by this method, as it would not be necessary to go above the top of the beams with the top line of the concrete, unless a tile floor were required, and then only enough to make a bed of cement in which to lay the tile. If a wood floor was to be laid, the sleepers could rest directly on the beams, and could be fastened to the part of the suspenders passing over the beams, so that no bedding would be required; this would leave sufficient room under the floor boards for all the pipe and wires required through the building.

Results and Claims.

It is claimed for this method of construction that the permanent load on the iron beams is reduced at least 50 per cent.; the strength of arches is increased over 50 per cent.; the fire proof material is more securely attached to the iron beams, and will not fall off from the effect of heat or from vibration of the floor; air spaces are provided between the fire proofing and iron work. An arch reaching from top to bottom of 15-inch beams will weigh less than 18 per cent. more, the thickness of section being the same, than an arch 10 inches deep, and will not cost over 8 per cent. more; the cost of fire proofing will be greatly reduced, with a saving in weight of about 40 pounds per square foot of floor.

Work is actively progressing on the buildings for N. & G. Taylor Company's new tin plate plant in Philadelphia. The ground was cleared and construction of the factory commenced five weeks ago, and it is confidently expected that the works will be ready for operation by the first week in August, although a few of the stacks may be put to work by the middle of this month. The new factory is most conveniently situated on the corner of Meadow and Tasker streets, almost within a stone's throw of the river front, with two lines of railroad running past the doors. Sidings from these lines will communicate with the interior of the works, so that transport of goods and material by land or water will be facilitated. The property on which the tin-plate works are being erected comprises half a block, with a ground space of 506 x 148 feet. Brick and iron are to be used exclusively in the construction, the flooring being of asphalt, rendering the buildings

completely fire proof. It is said that this will be one of the largest and most complete tin-plate plants in the world.

Mesaba News.

An adjourned meeting of the Cincinnati Iron Company was held Monday afternoon at Duluth and several propositions made the directors for a lease of the property were considered. With the single exception of the Biwabic the Cincinnati is the largest mine on the new Mesaba range, its ore in sight on three test-pitted 40-acre tracts being estimated at not less than 5,000,000 tons, with the bottom of the deposit not in sight. Three propositions were before the meeting; one from M. D. Moore, at one time a chief boomer on the Gogebic range, who agreed to a 300,000 ton minimum production and would pay a sliding royalty based on 50 cents a ton when ore was selling at Cleveland at \$3.50, and 5 cents more for every 25-cent advance in price; one from S. L. Seldon of Duluth said to be representing the Schlesinger interests, who would pay 55 cents a ton on all Bessemer ore above 62.5 metallic iron and 50 cents on all below, on a minimum output of 200,000 tons yearly, and a third from Barbour & Bates representing a syndicate headed by Henry C. Oliver of Pittsburgh. This last proposition was accepted and Mr. Barbour has already paid \$5000 to bind the bargain. This proposition guarantees a minimum output of 150,000 tons, with a proviso that the lessees shall explore three additional 40-acre tracts belonging to the Cincinnati property, and if they find ore on them shall increase the minimum 30,000 tons. They pay a royalty of 55 cents a ton and advance \$25,000 of this at once.

Barbour & Bates represent a syndicate comprising the Oliver Iron and Steel Company of Pittsburgh, interests in the Pittsburgh & Western Railway, a line of 12 steam ore carriers on the lakes, docks at Fairport and some 20 furnaces along the Pittsburgh & Western and Baltimore & Ohio railways. These interests will at once organize a company to work the mine, and the lessees agree to mine the property for all it is worth.

The lease to these parties is believed to be an excellent one, though some Cincinnati stockholders thought the minimum should be several times larger. There is no doubt that the Cincinnati can mine for the 19 years of the lease 500,000 tons a year and possibly more, but a forced output of any such amount would, it was thought, have a bad effect on the Mesaba range.

There is now an assured output on the range of 700,000 tons a year, beginning with 1893. Of this 400,000 will be from the Biwabic, 150,000 from the Ohio, which has been lately leased by the Hamilton Ore Company, and the Cincinnati. Other mines are now under negotiation for lease, most of them, however, under much smaller minimums than these.

The unusually wet season, the poor means of getting into the Mesaba properties and the state of the ore market have combined to make progress slower on this new range than it would otherwise have been, but it has been speedy enough. A vast amount of work has been done and every week not only shows more ore, but more of a high grade. Since the finds in the Ohio pits, where blue hematite as high in iron as 67 per cent. was struck, the same quality of ore has been struck in other mines, notably in the deepest pits in Biwabic, Cincinnati, Mesabi Mountain and others. This gives a greater proportion of Bessemer ores and makes the outlook far brighter for the entire range.

John T. Jones of the Hamilton Ore Company, who are the lessees of the

Biwabic Mine on the Mesaba range, tells your correspondent that the more he sees of the Mesaba the more he regards it as the future dictator of prices on Lake Superior Bessemer iron ore. "The deeper we get in the pits," says Mr. Jones, "the better we find the ore, and the more sure is the future. Every week adds to the prominence of the Mesaba as an ore producing range." In the Biwabic 150 men are now at work, stripping the surface of sand, gravel and hard pan from the ore body. This surface varies from 2 feet in thickness at the northern edge of the property, where the ore is bounded by the greenstone, to 30 feet at the southerly limit of the mine. "Twenty feet is more than the average stripping," says Mr. Jones. Below this surface of earth has already been uncovered an average depth of 70 feet of ore. In the most northerly pits the ore was penetrated at a depth of 58 feet, but nowhere else has any shaft gone to the bottom of the ore body, and several are now 85 feet in iron. Some of the southerly pits are 115 feet deep, and give no signs of an end to the ore.

"I have had nearly 200 assays made," said Mr. Jones, "but have not tabulated them yet, as I intend to issue a little statement shortly. I can tell you this, however. There is a body of ore averaging 60 feet thick, which will average 66.50 in iron and below 0.020 phosphorus. The average of the entire ore body, so far as we have uncovered it, is about 64 iron and 0.040 phosphorus. This puts the entire Biwabic in the Bessemer limit. One remarkable fact in connection with the operations of the Biwabic, a fact common to many other of the Mesaba mines, is that in not one of the test pits or shafts so far sunk, ranging from 60 to 115 feet deep, has a pound of powder been used. Pick and shovel have done the whole work.

On the Biwabic open or surface mining will be employed exclusively. There will be no underground shafts or drifts, at least not for a long time. This is interesting as probably indicating the manner in which nearly all the Mesaba mines will be worked, developments on the Biwabic being in advance of any others, and being in a certain measure a type. "From the depth of ore already known to exist 1 yard of stripping uncovers 3½ yards of ore," says the manager of the mine. "In every yard of ore are 2½ tons. In other words, the cost of stripping averages us about 3 cents per ton of ore. Additional depth in the ore body will decrease this cost proportionately. When we get to mining we shall make a cutting similar to a railway cut into the ore body. In this cut we shall lay a standard gauge track and put in position a steam shovel. If we find the ore body too dense to be mined and loaded into cars directly by the shovel, we shall use black powder and loosen it up in lots of 3000 or 4000 tons. That is all the mining required. Then the steam shovel will do the rest. Men of other ranges who claim that the talk of steam shovel mining on the Mesaba is foolish want to wait just a few months. As soon as the Duluth, Mesaba & Northern road is completed to the mine, about September 1, we shall begin shipping.

The Biwabic is leased under a minimum output guarantee of 300,000 gross tons from the 120 acres of the Hamilton Ore Company deal. All of this, and probably more, will be used by furnaces in which P. L. Kimberly is interested, so that the mine will not be a shipper to market until after it has supplied the Kimberly furnaces with nearly 400,000 tons of ore.

I have made this somewhat extended preliminary account of the Biwabic methods, as there is not at present any mine in the world that can be operated at anything like the small expense of this. The future of the Mesaba, therefore, as a factor in prices and in the output of other ranges

is a question well worthy of consideration.

There is but one answer to the question, "How will the Mesaba affect Duluth?" There is on the range a great quantity of ore that the mining companies, to ship at all, must have a market for here. Ore averaging from 55 to 58 and 60 per cent. iron is in profusion; it must be mined, but its low grade will not warrant shipment to

furnace, using this class of ore, last year cleared 57 per cent. on the money invested.

The Swisher Automatic Boring and Turning Lathe.

The Swisher lathe is designed for use in boring and mortising, shaping, turning and screw cutting, as well as milling,

screw E, placed, as usual, on the front of the bed. The head stock F is fixed on the bed, and its frame comprises three transverse parallel uprights, in which the hollow mandrel, the back gear and differential clutch gearing are mounted.

The standard of the tail stock is formed of two parts, the lever sliding upon the shears, while the upper is adjusted laterally or transversely upon the other by

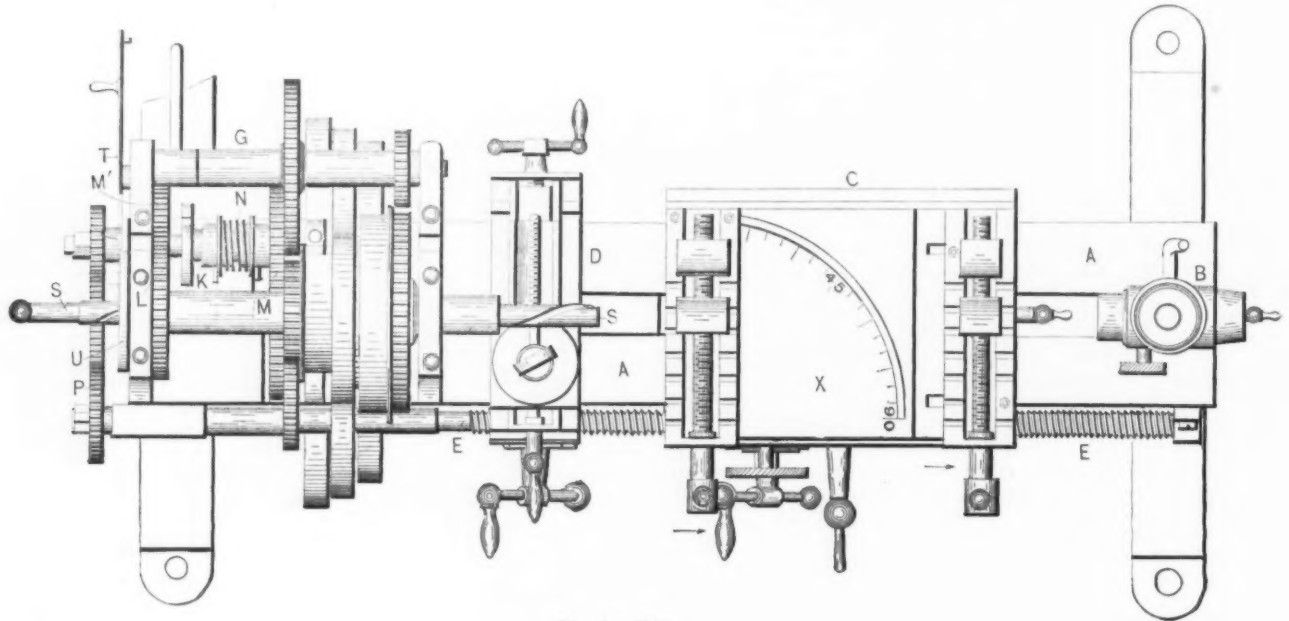


Fig. 1.—Plan.

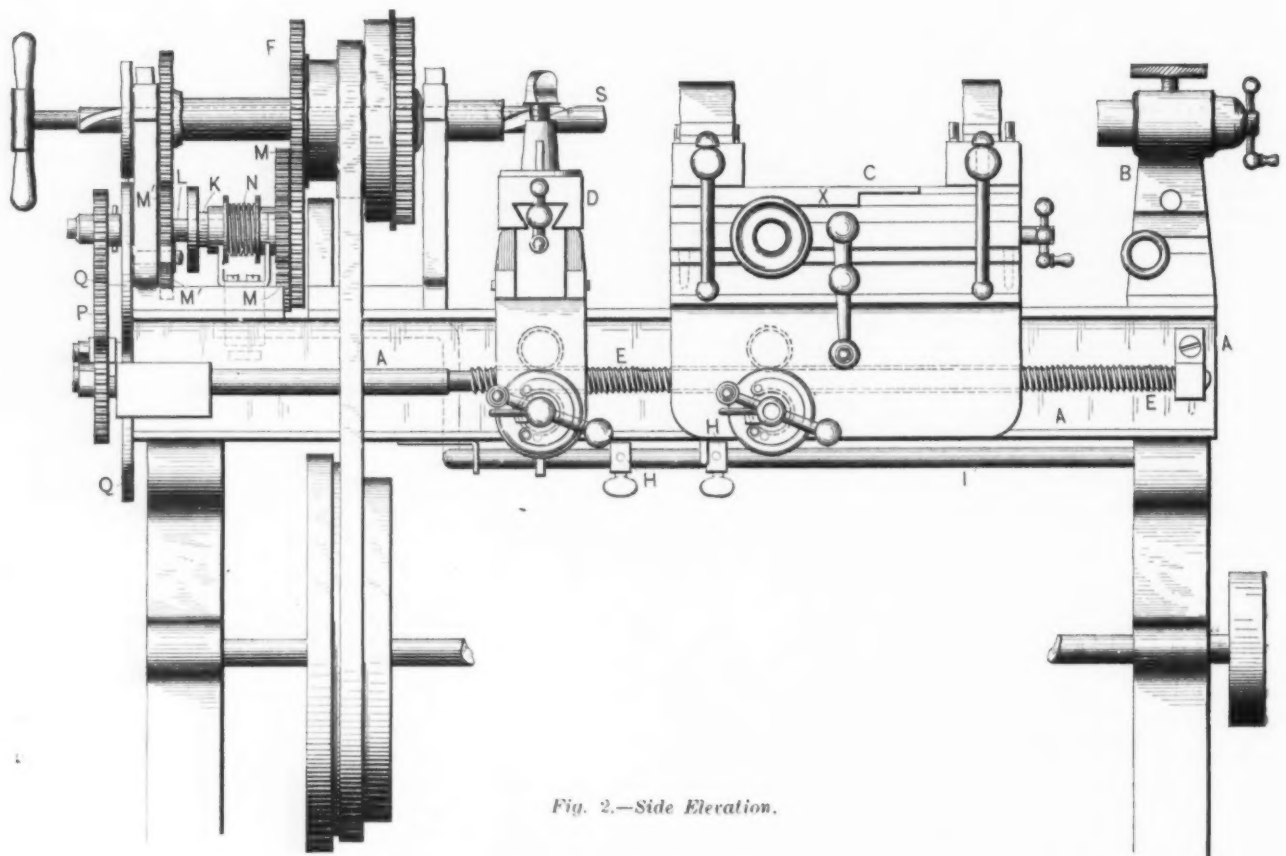


Fig. 2.—Side Elevation.

THE SWISHER AUTOMATIC BORING AND TURNING LATHE.

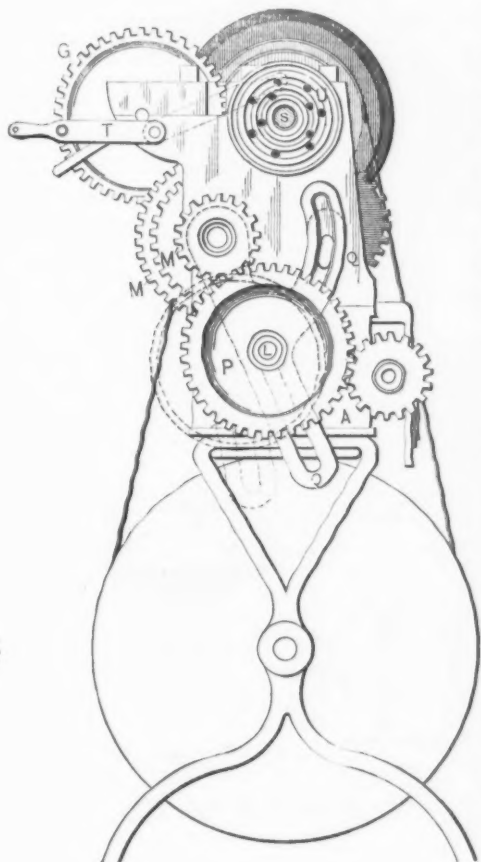
the East. This can be bought by furnaces here at less than \$1 a ton. In a furnace it is as good as any, except that it requires a little more fuel and makes a little more slag to the ton of pig iron. Furnaces located here can use this ore at a great profit, and they will do so. The advantages of the situation here in this respect are apparent and are great. A near-by

planing and rifling. The bed A of the lathe has the usual parallel shears, on which the tail stock B, work holder C and tool carriage D are mounted and arranged to slide. The tail stock is adjustable on the bed, and is provided with means for clamping it in any desired position; but the tool carriage D and work holder C are reciprocated automatically by the feed

means of a screw. Both parts are clamped to the shears by a rod having a nut at its lower end, and which is tightened by a crank, the shaft of which has an eccentric part passing through a loop in the upper end of the rod. This does not prevent lateral adjustment of the head or upper part of the tail stock, since the eccentric portion of the crank shaft is elongated to

allow the loop to slide on it lengthwise, and both of the parts are chambered to allow the requisite lateral movement relatively to each other, and of the upper one in relation to the clamp rod.

The base of the work holder C slides on the ways, and is provided with an apron, Fig. 2, to the inner side of which two worm gears are attached and arranged on opposite sides of the feed screw E. The upper gear rotates loosely on its pivot, and the lower one is fast on the crank shaft. Both gears are in constant engagement with the feed screw, so that by rotating the crank shaft the work holder may be reciprocated by hand. The lower gear may, however, be locked and prevented when desired to feed the work holder C by rotation of the feed screw E. This is accomplished by means of a spring pin, suitably arranged. The work holders proper



The Swisher Automatic Boring and Turning Lathe.—Fig. 3.—End Elevation.

are two vises mounted on the top plate X of the work holder, as shown in Figs. 1 and 2. The one nearest the head stock is pivoted at one end, and its free end is provided with screws passing vertically through it, and having flanged heads which work in a curved undercut groove formed in the top plate, as shown in Fig. 1. This groove is graduated as indicated. The slotted frame of the vise may be clamped at any desired angle to the head stock, and the outer jaw of the vise may be slid toward or from the other jaw by means of the screw shown. The vise nearest the tail stock may be adjusted lengthwise of the work holder—that is, toward or from the head stock—in order to enable it to be used for holding articles of different lengths. The whole top plate X, with both vises, may be adjusted lengthwise, and may also be elevated as required. The tool carriage D is so constructed that it may be operated and adjusted manually, or be reciprocated automatically in the same way as the work holder.

The hollow mandrel of the head stock is journaled in the outer two of the three

uprights of the head stock F and provided with a stepped speed pulley. Parallel to it is the shaft of the back gearing G, Figs. 1 and 3, usually employed on engine lathes.

It now remains to describe the clutch-shifting mechanism which automatically reverses the rotation of the mandrel and the movement or feed of the work holder or tool carriage, as the case may be. Both of the latter have a pendent finger adapted to come in contact with tappets H on the rod I arranged under and parallel with the front portion of the lathe bed, where tappets may be adjusted to any desired position on the rod. This rod slides in its supports and its front part is bent inward horizontally and then upward and connected with a sliding plate having two forks, which engage two flanged sleeves adapted to slide on the sleeve K of the shaft L, and having a spline connected therewith and arranged between the large and small gears M M'. The shaft L has its bearings in the outer and middle uprights. The gears are loose on the shaft and have a circular recess on the inner side and also a lug that projects into the recess. The sleeve K has a circular flange or head on each end and each flange has a notch to receive the lug. A spiral spring N encircles the inner ends of the sleeves, and holds them normally separated. It will be seen that when the work holder C moves in either direction its pendent finger will engage one of the tappets H, and thereby shift the rod I lengthwise, which, through the medium of the forked plate, will move one of the notched heads or flanges of sleeve K out of engagement with one of the recessed gears M or M' and carry the opposite flange into engagement with the other gear M or M', thus reversing the rotation of the feed screw E, so that the motion of the work holder C is also reversed. In other words, when the clutch shifting rod I is thus shifted the effect is at once to remove one of the notched heads out of engagement with the adjacent gear M or M' and to force the other head or flange against the other gear; but it usually happens that the notch or recess of the latter is not in position to allow the flange or head to enter it, since the notch and lug of the adjacent and contacted parts do not then coincide; but the spring N holds the parts pressed together until the continued rotation of the gear brings the notch and lug opposite each other, when it forces the head into the recess in the gear, and thereby effects the engagement.

(We may add, in parentheses, that the movement of the tool carriage is accomplished in the same way.)

The gear connection between the mandrel and shaft L and feed screw E is effected by the following means: The loose clutch gear M', Figs. 1 and 2, is in constant mesh with a gear which is fast on the mandrel, and the corresponding but larger clutch gear M is similarly engaged with a pinion, Fig. 2, attached to a large gear that meshes with a small central gear on the mandrel. The connected pinion and gear rotate free on a horizontal journal, which is fixed in the intermediate upright. It will now be apparent that the gears on the mandrel constantly rotate with it in one direction, and will impart motion alternately to that one of the loose clutch gears M M' on shaft L which is at that time locked with such shaft by means of the sleeve K. Through this shaft L and the gearing on the end of the bed A motion is imparted correspondingly in one direction or the other to the feed screw E. The last-named gearing is composed of small gears, on the shaft L and feed screw E, respectively, and a larger intermediate gear, P, that normally meshes with them; but this larger gear is mounted on a forked and slotted arm, Q, that is pivoted on the shaft L and may be shifted around for engaging with or disengaging from the gear on the

feed screw. A clamp bolt works in the arc slot of the arm Q and serves to clamp the latter in any adjustment for holding the arm in the required position. When it is not desired to operate the feed screw E the arm Q is adjusted to remove the gear P from mesh with the gear, and this is generally required when the rifling tool is brought into use. A rifling rod, S, Figs. 1 and 2, is arranged to slide in the mandrel, it being operated manually. A screw enters the spiral groove in said rod S and compels it to revolve as it is reciprocated.

When the machine is used for rifling or milling, the mandrel is locked by a spring catch T, whose point enters any one of the holes in the grooves of a space wheel or disk, U, mounted on the outer end of the mandrel, adjacent to the outer upright. The arm Q is also shifted to throw the feed screw E out of action, so that the tool carriage and work holder will remain at rest. The catch T is pivoted to the upright of the head rest, and its spring shank holds it normally engaged with the disk, but permits easy disengagement when required. The pin or point of the catch is adjusted in different holes of the space disk, according to the number of rifles or grooves to be cut. The gun barrel to be rifled is held in the vises.

This machine is made by I. C. Swisher of Coffeyville, Kan.

Launch of the Texas.

The steel battle ship Texas was launched recently at the Norfolk Navy Yard, where she had been in course of construction for nearly six years. The Texas is a twin vessel to the Maine, which was launched at the Brooklyn Navy Yard on November 18, 1890. The latter will shortly be ready for her steam trial, but it will be at least two years before the Texas can be made ready for sea. The vessel is built of steel throughout, with a double bottom so arranged that the compartment may be used for water ballast. For defense she has a water-line belt of 12 inch steel armor in the wake of the magazines, engines and boilers. The dimensions are: Length, 301 feet 4 inches; breadth, 64 feet 7 inches; mean draft, 22 feet 6 inches; displacement, 6300 tons; indicated horsepower, 8600; maximum speed, 17 knots.

The main battery will consist of two 12-inch breech-loading rifles mounted in turrets and six 6-inch breech loading rifles protected by shields. The turrets for the 12 inch guns will be placed *en echelon*, one on the port side just forward amidships, and the other on the starboard, just abaft amidships, so as to give each a fore and aft fire. Each of the 12 inch guns will have a complete broadside fire on one side, and a train on the opposite side of 40° for the forward gun and 17° for the after gun. One of the 6-inch guns will be mounted just forward of the line of the 12 inch gun on the port side, and another will be mounted just abaft the line of the big gun on the starboard side. But both of these 6-inch guns will be set on the line of the keel, or along the middle line of the ship. The other 6 inch guns will be mounted in sponsons on the main deck, extending out from either side of the ship, two having a train from directly forward to 25° abaft the beam, and two from directly aft to 25° forward of the beam.

The motive power will be supplied by two triple-expansion engines, placed in two separate water-tight compartments, and driving twin screws. The steam will be furnished by four double-ended boilers, each 14 feet in diameter, and 17 feet long. The estimated steam pressure is 150 pounds. In addition to the electric light equipment she will have electric search lights fitted on the hurricane deck and on the chart house.

The Muncaster Valve Gear.

From *Engineering* of London we take the following description of the valve gear designed by H. Muncaster and applied to a horizontal engine built by the Lilleshall Company (Limited) of Wellington. The engine is of the self-contained type with bored guides; the cylinder is 9 inches in diameter, with a stroke of 12 inches. The crank shaft is $3\frac{1}{4}$ inches in diameter in the journals, with bearings 6 inches long; the pedestals are fitted with caps and adjusting wedges.

The automatic expansion gear, comprising, perhaps, the smallest number of parts by which it is possible to obtain an automatic arrangement, gives a range of cut-off from 0 to about five-eighths of the piston stroke.

The expansion valve is operated by a bell crank *b*, which is pivoted on a stud fixed to a projection on the main-eccentric rod *e*; the other arm of the bell crank is connected to a link swinging from a gudgeon *f*, which is in connection with the

work is firmly bolted to the bed, and after connecting the rod to the governor the whole apparatus is complete.

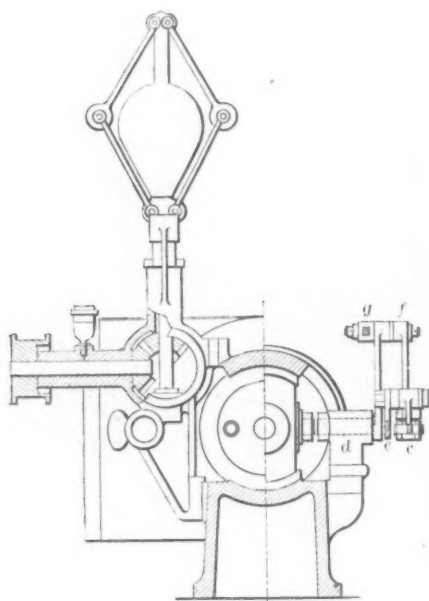
Pennsylvania Bolt and Nut Works.

Among the iron industries in Eastern Pennsylvania which have made rapid strides within the last few years, the Pennsylvania Bolt and Nut Works of Lebanon hold a prominent place. Since their foundation, nine years ago, these works have made remarkable progress. Instituted, as their title indicates, for the purpose of manufacturing bolts and nuts, their borders have been steadily enlarged, facilities increased and new lines added, until at this date they possess rolling mills which are among the largest and most complete of their kind in Eastern Pennsylvania, as well as being an important factory for bolts, nuts, washers, boiler rivets and kindred lines of goods. The company's plant now occupies an area of 12 acres, the establishment affording employment to over 1000 workmen, with an average output of

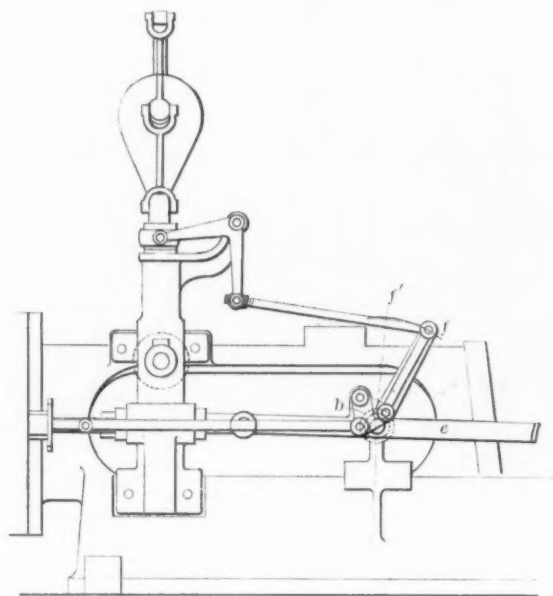
full line of modern and efficient machine tools. The threading shop, pattern shop, shearing shed, boiler house, keg factory and warehouse have each a separate building allotted to them, and there are two spacious bolt and nut factories, one having been quite recently added to the plant in order to meet growing requirements in that direction. The works are self-supporting, producing all their own iron and building their own machinery, as well as making the kegs used for the bolts, nuts, &c., and any wood work required.

The manufacture of car forgings is a recent and important branch, and these, with the company's staple lines of production, command a wide market, being supplied to every State and territory of the Union, as well as to several foreign countries, particularly to the Central and South American states, to which large shipments are made.

Three additional double puddling furnaces are now in course of erection, and will be put in operation by the end of July. A large pumping establishment on the com-



Sectional End View.



Side View.

THE MUNCASTER VALVE GEAR.

governor, the position of this gudgeon determining the point of cut-off. The gudgeon is fixed to the end of a radial arm which vibrates from a center fixed to the bed frame of the engine; the lifting of the governor brings the arm more nearly upright and the gudgeon into the position *f'*, where it operates on the bell crank *b* as to give an early cut off.

The cut off valve is a hollow cylinder working in the main valve, but it may be simply a flat plate, except that it is desirable to put as little work on the governor as possible, to allow of its being made very sensitive.

This gear, which has been very successfully applied to engines of from 8 to 500 indicated horse power, can also be used as a trip gear for Corliss and double beat valves, and may be arranged to trip automatically from zero to three-quarters of the stroke.

When it is desired to apply the gear to existing engines, where the present governor can be again used and the throttle valve replaced by a cut off valve, a stud is fixed in the main eccentric rod near the eccentric end and the link work coupled to it; the bracket supporting the link

125 tons of rolled iron daily, some 70 tons of which are consumed in the bolt and nut factory alone. We are informed that a ready market is found for the material not required for home use.

The works at Lebanon are favorably located on the line of the Philadelphia & Reading Railroad, with which system, as well as with that of the Pennsylvania Railroad Company, their own sidings, traversing the entire establishment, are in direct communication, affording superior advantages for the shipment of goods to all points.

The buildings are numerous, being so arranged that the material is carried on from one to another in direct sequence during the process of manufacture. They include three rolling mills, containing five trains of rolls. Mill B—the largest—has a measurement of 150 x 200 feet, with a height of 60 feet, and the other two are little less in size, while all are light and airy structures. A large forging shop has recently been considerably increased in size, and the machine shop has been enlarged to double its former dimensions in ground space. The latter is a very fine building, 200 x 75 feet, equipped with a

pany's premises, by which water is obtained from the adjoining Quittapahilla creek, is able to supply the whole City of Lebanon with that indispensable element during times of scarcity, usually for two months every year.

Constant progress in every department, and a judicious and enlightened enterprise have marked each stage of the career of this establishment, particularly since it has been under the able administration of James Lord, its present general manager. The works have been running to full capacity, on double turn, for a considerable time, and the business outlook promises well. Over \$200,000 have been expended during the last year or two on extensions and improvements.

The Pennsylvania Bolt and Nut Works were founded in 1883 by a company of which Mr. Eckert of Reading, Pa., was president. That gentleman held his position for some years until the company were reorganized and the business disposed of to the present board, consisting of Arthur Brock, president; Edward R. Coleman, vice-president; James Lord, general manager and treasurer, and Wm. B. Middleton, superintendent.

The Bliss Automatic Friction Clutch.

With the regular form of automatic clutch the driving wheel of a power press revolves freely on the shaft until a pressure on the foot treadle, by releasing a key or similar device, establishes a sudden connection between them. Where the slide is heavy and has to be kept tight in the guides, the shock resulting from the sudden impact acts like a heavy blow on the clutch parts, and thereby necessitates frequent repairs and causes vexatious delays. With the Bliss automatic friction clutch—for which patents have been applied—these difficulties are overcome. The construction and operation of this clutch will be

The press shown is one of a series of 11 sizes. It weighs about 25,000 pounds and has 54 inches between the uprights, thus adapting it for gang punching, the operation of cutting and forging dies set side by side, and long bending dies.

It is made by the E. W. Bliss Company (Limited), 11 Adams street, Brooklyn, N. Y.

The prosperity of Hoosick Falls, N. Y., has for many years been dependent upon one industry, the Walter A. Wood Mowing and Reaping Machine Company. Several years ago the Hoosick Falls Water Power and Light Company purchased about 25 acres of land adjoining that of the Wood Company, situated on both sides

two stories, and several other smaller buildings. The buildings and machinery will cost about \$60,000, and from 200 to 300 men will be employed. The shops will be complete in their equipments and facilities, the machinery being of the latest and most improved patterns. A feature of the shops will be the running of the lathes, planers and boring mills by separate electric motors, thus dispensing with lines of heavy shafting. Overtures have been received by the company for power for other industries which contemplate locating there. F. A. Sawyer of Portland, Maine, for ten years with the Thomson-Houston Electrical Company, and A. R. Brown of Boston, formerly with the Post Engineering Company of that city, are at Hoosick Falls to manage the new enterprise.

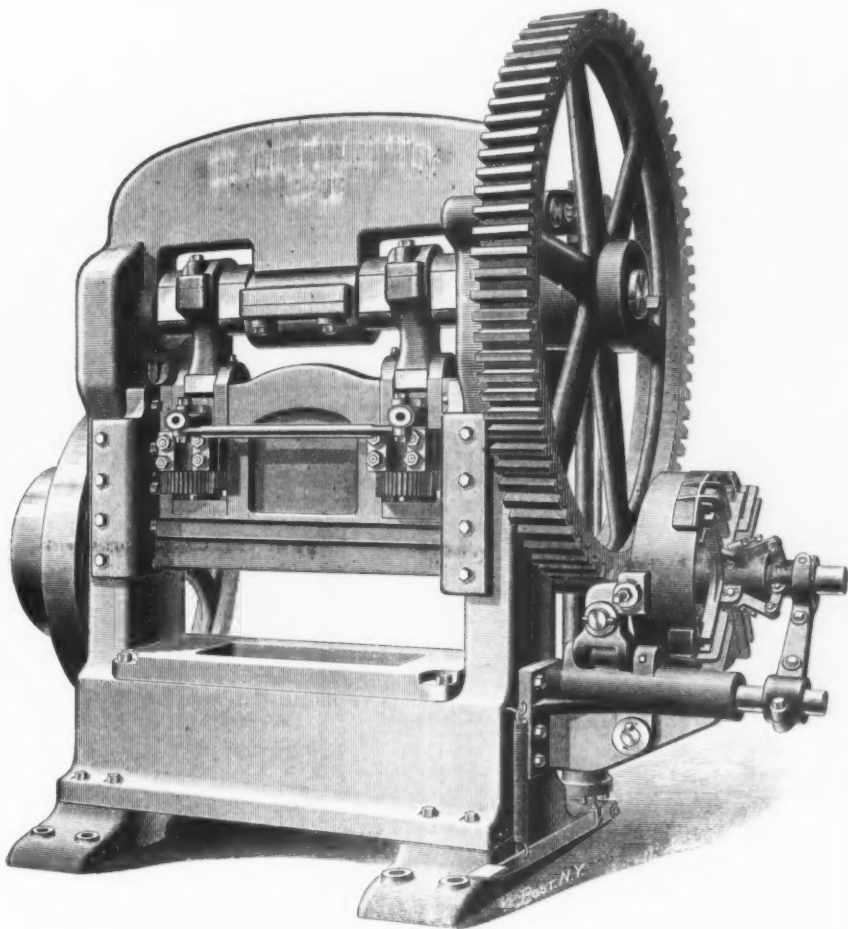
Transcaucasian Manganese.

A Tiflis correspondent to the *Economist* writes: About 40 versts (26 English miles) from the station of Kvirily, on the Transcaucasian railway, there was discovered some years ago manganese ore in very large quantities, and of a superior quality. In 1879 the representative of the firm of Krupp of Essen made the first attempt to work out the ore. The quantities of ore are stated to be very large, as the surface of the manganiferous lands is said to be no less than 84 square English miles. The ground belongs to a great many proprietors, mostly peasants, and the extraction of the ore is carried on in a primitive way. The cost of the output varies from 2 shillings and 6 pence to 4 shillings per ton; the proprietors get for their rights about 2 shillings and 6 pence per ton; the carriage from the mountains and to the railway station varies from £1. 4/ to £1. 16/ per ton, and the railway carriage from Kvirily to Poti, inclusive of charges on board the ship, amounts to 8 shillings per ton. The price of the manganese ore on board the ship in Poti (Black Sea) can be taken at about £2 6/ to £2 8/6 per ton, the freight from Poti to England being about 12 shillings per ton. The quantities of manganese ore brought per railway to Poti and Batoum, and the exports from these ports can be seen from the following table:

	Brought per railway.			Exported to foreign countries.		
	To Poti.	To Batoum.	Total.	From Poti.	From Batoum.	Total.
	Tons.	Tons.	Tons.	Tons.	Tons.	Tons.
1891	85,834	4,439	90,273	128,006	10,303	138,309
1890	119,350	9,253	128,603	120,330	10,303	130,633
1889	11,800	12,495	24,295	40,700	11,219	51,919
1888	24,000	7,619	31,619	41,552	6,981	48,533
1887	66,227	10,247	76,474	49,360	9,922	59,282
1886	41,438	19,800	61,238	35,413	19,504	54,917

About two-thirds of the quantity exported go to England. The carriage is rather high at present, but as soon as the railway that is now being built is opened (in January, 1893, it is expected) from Shorapan to Tebiatari, it is proposed to pay 16 shillings per ton for the new line, plus the carriage from the mountains, so that the difference in the carriage then as compared to the present cost will be about 12 shillings to 15 shillings per ton. It is hoped that England—the greatest producer of iron and steel—will in future increase her purchase of Transcaucasian manganese ore, thus stimulating the business here.

Bethlehem, Pa., the seat of the great iron works, has just celebrated the 150th anniversary of its founding.



THE BLISS AUTOMATIC FRICTION CLUTCH.

understood from the annexed illustration of a press adapted for very heavy forming, forging and punching. A pressure on the foot treadle shown releases a weight which actuates a powerful friction clutch. In order to avoid too sharp an action of this weight, it is connected at its lower end with a dash pot.

After the shaft has made one complete revolution a cam releases the friction clutch, bringing into action at the same time a brake, thus stopping the slide at the highest point of the stroke.

The large gear wheel, instead of revolving continuously, is, with these new clutches, keyed on to the shaft, and at a standstill until the clutch is thrown into action. This constitutes an additional advantage, in the saving of considerable wear on the shaft and wheel hub.

There is nothing about these clutches which is liable to get out of order, and for whatever wear may be occasioned by continuous use easy means of compensation are provided.

of the Hoosick River and available for manufacturing purposes. The company have expended about \$130,000 on the property, and to day they have almost unlimited water power, and are perfectly equipped with machinery for both arc and incandescent lighting. But this valuable water power is to be more fully utilized by the introduction of a new and one of the most promising of industries, the manufacture of steam road rollers and road construction machinery. A New England corporation have contracted to take at least \$125,000 of the machinery produced by the company annually for five years. The Hon. J. Russell Parsons, a director of the W. A. Wood Company; Easting, Rising and Worden, C. L. Eldredge, Supervisor Frank Riley and other prominent business men have subscribed largely for the stock. Some time in July the company will commence the erection of the necessary buildings, which in part will consist of a machine shop, 75 x 200 feet; foundry, 100 x 100 feet; wood shop, 50 x 100 feet,

The Chase Magnetic Ore Separator.*

BY HARVEY S. CHASE, S.B., NEW YORK CITY.

The problem of practically separating iron ores, as found in the mines, is very different from the separation of a purely magnetic substance from a purely non-magnetic one, since the crystals of magnetite, scattered through the ore-bearing rock, and sometimes collected in masses, are of very different sizes. The average size of the particles may be definitely ascertained for each mine, and the crushing and screening machinery may be adapted thereto, but there will still be a large percentage of very fine crystals which, in the crushing for the average,

in the mixed particles, then a third (and if necessary, a fourth, &c.) division, and finally, a practically pure magnetite as heads. The first tails go to the dump, the heads, comparatively coarse, are sent at once to the bins or cars, and the second and third or other tails, which may amount, perhaps, to one fourth of the crude material, are re-treated on a second separator, and such portions of them as may require it are crushed sufficiently fine to break the magnetite from the gangue. The fine crushing of three-fourths of the product is thus saved, and the cost and wear are correspondingly reduced, while the concentrates contain mainly coarse particles. These facts have been appreciated for many years by those skilled in the art; but the mechanical and electrical difficulties in the designing of practical

plicity and low cost for repairs which distinguished that apparatus, but have changed the form and the electrical arrangement, and have added other magnetic parts which essentially modify the action of the separator and the character of its products.

The present form of the magnetic wheel is a solid soft-iron roll of small diameter (4 inches or less), and of any desired length (usually 3 feet), in which two helical grooves of about 1 square inch section are cut. In these are wound coils of continuous copper wire or ribbon. There being two spiral grooves (constituting, in fact, simply a double-threaded screw), the wire carries the electric current in each groove in the opposite direction from that of the current in the adjoining groove, so that a magnetic circuit is set

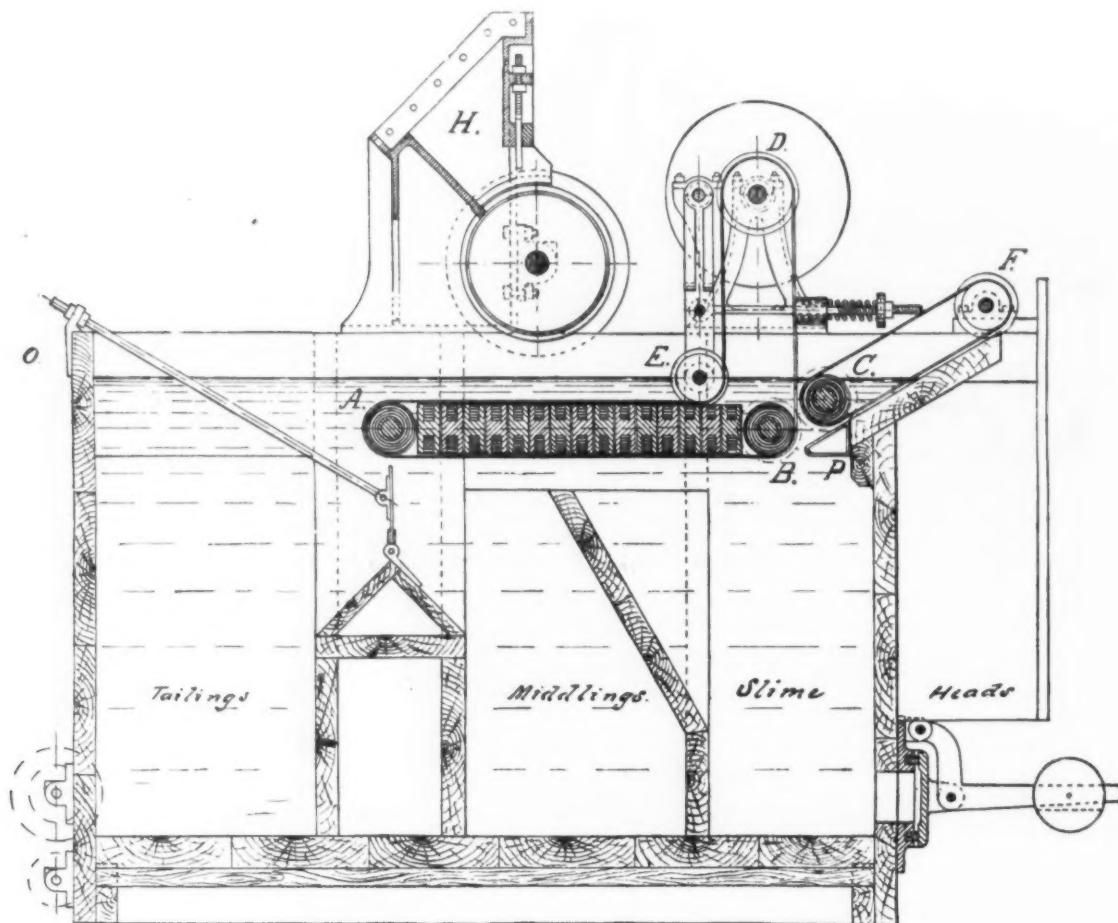


Fig. 1.—Section of the Chase Magnetic Ore Separator.

will not be broken apart from the gangue. If these mixed particles are thrown into the heads they carry gangue with them, and if thrown into the tails they occasion a loss of iron ore. There are two methods for preventing such loss. One is, to crush all the material to the size of the finest particles, which means, of course, a large crushing plant, heavy wear and tear, and excessive cost for repairs, and the production of only a very fine grained concentrate, which our blast furnace managers, to say the least, do not ardently desire. The other, and only practical method, is to crush at first to a comparatively coarse size, determined by the character of the material, and to separate immediately upon a machine which has a power of selection, and which will throw off a first grade of tails, containing practically no magnetite, then a second tails or middlings, with iron

machines were deemed by many to be insurmountable. There are, however, now on the market, as already remarked, a number of forms of separators which act on this principle, and are excellent machines, each protected by special patents.

The machine which is the subject of this paper is one of these. In designing it we have endeavored to keep in mind the essential requirements for machinery subject to rough usage—viz (in addition to efficiency and economy of operation), durability, simplicity of design, and convenience for replacing quickly by ordinary unskilled labor any disabled parts—considerations which apply as well to magnetic separators as to the other machinery connected with mining.

This machine has grown out of the original Lovett Finney magnetic separator, which has been running successfully at Weldon, N. J., for 18 months or more. We have retained the features of sim-

up, which converts the screw thread into continuous helical poles of opposite polarity, and forms, with a minimum amount of iron, copper and cost of manufacture, a magnet of extraordinary strength, with a continuous field of magnetic force all over its circumference. A thin drawn-brass tube is slipped over this roll, protecting it from injury, without impairing its properties as a magnetic wheel, equally efficient per square inch of surface whatever the length of the roll may be.

In the Chase separator, as shown in Figs. 1 and 2, there are three of these magnetic rolls, A, B and C, Fig. 1. The function of the first roll is to separate a wholly non-magnetic grade of tails from the remainder of the material treated. As the crude material is fed upon a belt, which approaches the wheel horizontally, the necessary consequence is that every particle of magnetic oxide of iron comes immediately within the scope of the magnetic field, and

* Read at the Flattsburg meeting of the American Institute of Mining Engineers.

cannot escape until carried by the rotation of the roll around to its under side, while the non-magnetic tails fly off tangentially.

The pure magnetite, the mixed particles, and a considerable amount of non-magnetic dust, all cling together to the belt against the under side of the roll, and are passed on by the movement of the belt to the first of a series of horizontal magnetic poles. These are "consequent poles," developed by winding a soft iron yoke alternately in opposite directions, and inserting between these windings soft iron bars to form the poles. A tumbling motion is immediately set up in the mass; the middlings drop quickly into their receptacle; the fine dust continues further, but falls also into its receptacle, while the

the cheap cotton-duck belt which receives all the wear from the ore, enduring, by reason of its softness, as wax does before the sand blast, the blows which would cut rapidly into a harder and stiffer material. These belts have been in use for 18 months upon the separator at the Weldon Mine, in New Jersey, and have demonstrated their durability under these conditions.

The merit of this design is mainly in the comparatively small rolls and the short distances between the magnetic poles, which are never increased, however wide and correspondingly capacious the machine may be. The winding of the magnetic rolls in double spiral with continuous spiral poles gives a magnetic field of equal efficiency whatever the length or diameter of the rolls, and the winding of the

of round wires, thereby increasing the amount of current and decreasing the voltage, and therefore the tendency to leak, short circuit or burn out.

The main commercial objects of magnetic separation are, first, the diminution of the amount of earthy gangue, with a consequent increase of the percentage of metallic iron in the product, and second, the incidental elimination of phosphorus (usually present in apatite), and often of sulphur or titanium. A crude ore, carrying about 30 per cent. of iron, and reasonably coarse in structure, can be concentrated to 66 or 68 per cent. very readily. The loss of iron as magnetic oxide in the tails in practical every-day running will not exceed 3 to 4 per cent., while the total loss in the tails will depend

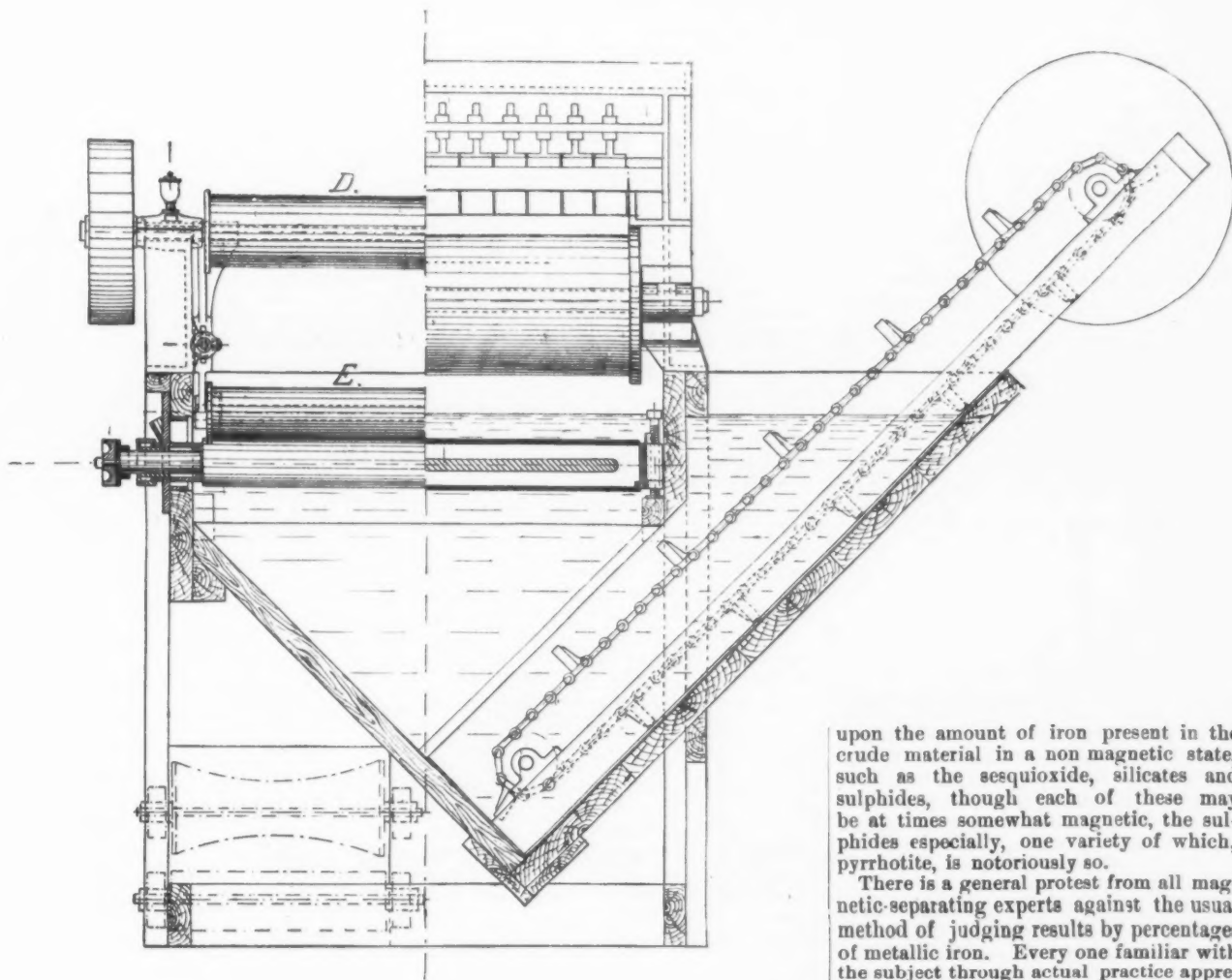


Fig. 2.—Cross Section and End Elevation.

pure magnetite passes along under all the poles and is delivered by the last of these to the second magnetic wheel B, which whisks the magnetic particles around the sharp corner, freeing them from the last grains of dust by this movement, together with the action of a blast of air or of water from the pipe P. The second wheel, B, delivers the magnetite to the third or picker wheel C, over which runs the second belt, which carries the magnetite to any desired point. The letters in Figs. 1 and 2, besides A, B, C and P, already mentioned, indicate the following parts: D, driving pulley; E, tightener pulley; F, non magnetic rolls, delivering heads; H, feed hopper and feed wheel; O, overflow.

The separator is simple in its construction and cheap to build. Its wearing parts consist of the bearings for the shafts and

intermediate magnet is such that it is exactly as efficient per square inch of surface whatever the width of the machine may be. There is, therefore, no limit to the width of the machines, except such as may be set by mechanical considerations.

The length of the separator depends entirely upon the length of the intermediate magnet, which decides the number of "tumbles" of the stuff, and thereby the quality of the concentrates. This may vary with different ores and degrees of fineness of crushing.

It is from experience, and not in obedience to any theory, that we have learned to design magnets which are decidedly "stubby;" that is, have very short magnetic circuits, short poles with not too great distances between them, and a maximum amount of current, which is attained by winding with ribbons of copper instead

upon the amount of iron present in the crude material in a non magnetic state, such as the sesquioxide, silicates and sulphides, though each of these may be at times somewhat magnetic, the sulphides especially, one variety of which, pyrrhotite, is notoriously so.

There is a general protest from all magnetic-separating experts against the usual method of judging results by percentages of metallic iron. Every one familiar with the subject through actual practice appreciates the misleading nature of this test in comparing results from different separators working on different ores. Especially is this true with regard to the loss in tails. Some rich ores leave, after separation, a very small amount of tails, so that a relatively minute quantity of iron lost may yet make a large percentage in the scanty tailings, while low-grade crude ore of the same mineralogical character and physical texture may, on account of the greater bulk of the tails, present, apparently, a much better showing in percentage of loss. The only proper way, in such comparisons, is to determine the percentage of magnetic oxide saved and the percentage lost, out of the original amount in the crude ore. This gives a basis for comparison, as to the efficiency of the machinery and its adjustment, which is not misleading.

For instance: An ore carries 38 per cent. of metallic iron in the crude, of which 3 per cent. is in silicates (hornblende), the other 35 per cent. corresponding to 48.3 of magnetic oxide of iron. In examining the results of separation, we find that the heads compose one-half of the original material by weight, and carry 67 per cent. of

iron, or 92.5 of magnetic oxide, equal to 46.3 out of the original 48.3 in the crude ore, while the tails contain the remainder, which is 2 per cent. of magnetic oxide out of the original 48.3 in the crude material; but this 2 per cent. is 4 per cent. of the weight of the tails themselves, which have only half the weight of the original material. In this case direct analyses of the tails would show 4 per cent. of magnetic oxide, equal to 2.896 of metallic iron, and also 6 per cent. of iron from the silicates, which, as the weight is only one-half, would be doubled in percentage, or a total of 8.896 per cent. in the tails. Yet there has been, in reality, only a loss of the original 3 per cent. of iron in the silicate and 1.448 of the original 35 of metallic iron, or 4.448 in both. This discrepancy between the apparent and the actual results is the greater as the proportion by weight of the tails compared with the crude material is less.

After all is said, it still rests with the crushing and granulating part of the plant whether there be financial success or failure. In nearly every case the crushing costs from four to five times as much as the magnetic separation, and requires, moreover, the greater part of the original cost of installation. It is for this reason that we believe that a separator which will relieve the crushing plant of a considerable portion of its work—thus permitting the use of a smaller plant for a given aggregate product, and greatly lessening both the initial outlay and the cost of current repairs, and which accomplishes this result by its ability to divide the coarsely-crushed mass of crude material into various distinct grades, each of which may be specially treated afterward, according to its needs—must be a factor of great importance in the problem of magnetic separation.

Another important point in favor of this machine is its adaptability to wet separation, by which I mean, to the treatment not of partially wet or damp material, but of material which is acted upon by the alternating poles when wholly below the surface of water. The action in this case is the same as in air, with the additional advantages of the solving and washing effects of the water, as well as the diminution of gravity of the particles, which fall more slowly from the belt. For separating very dusty ores the use of water is indeed essential, especially when the fine dust is, in considerable part, apatite, which is liable to cling to the magnetite and, in the dry process, to be carried into the heads in spite of strong air blasts. Under water there is no tendency on the part of any earthy minerals to cling to the magnetite; all the dust is washed off immediately, and the heads come out in a thoroughly cleansed condition, carrying 2 or 3 per cent. more iron and considerably less phosphorus than by the dry process.

The separator here described can be operated either wet or dry, without other change (for the latter purpose) than draining off the water from the tank and attaching an exhaust fan. When specially constructed, however, for dry work, the frame and arrangements are somewhat modified.

The machine works of H. J. Anthony at Amsterdam, N. Y., Palmer's large chain works at Riverton, Tenn., and the machine shop and factory of the Tremont Nail Company's works at Wareham, Mass., were burned last week.

The United States Wire and Cable Company, with a capital of \$1,000,000, have been incorporated at Albany to manufacture and sell wire, rope, cables and conductors of every kind for the transmission of electricity. The location of the company's business is Schenectady.

WORLD'S FAIR NOTES.

Building Progress During June.

Construction work on the fair grounds has not advanced rapidly the last month. June, like the month of May, presented unusually bad conditions for outdoor work. The rainfall stopped work 18 out of 30 days. This serious interruption was supplemented by damage from wind, water and lightning, but the damage was slight considering the severity of the storms. The rainfall for the month was 10.58 inches. This tremendous downpour flooded the foundations of the buildings and severely tested them, but without serious result. The largest available force of men was kept employed whenever possible, and on Friday last there were at work 7223 men, with an average of 6542 for the month.

The underground work, the laying of water and sewer pipe, has been, of course, greatly retarded, but a largely increased force of men is engaged at such work whenever possible. It has been impossible to open a ditch for any length because of its flooding and filling with sand.

All but two of the principal buildings being practically finished, the energy of the department is centered in these two—Manufactures and Machinery. Carpentry work is prosecuted 16 hours a day on the Manufactures Building, and the final order has been issued for 16 hours work a day on the iron work of Machinery Hall. This iron work is finished with the exception of the domes, and double work is required here to keep out of the way of the carpenters. Work has recommenced on the Forestry Building in the placing of the rustic columns, which form a colonnade around it. These columns are natural tree trunks from the various States. Two-thirds of this work is now finished. The making of permanent roads will begin soon. Much dredging of the interior waterways has been done.

The pile driving is finished for the peristyle, Music Hall and Casino, and the floor joists are being laid for the two buildings. The grading of the Government parade ground is well along. The carpentry and iron work of the Government Building is finished. The building is all inclosed and interior painting and plastering is in progress.

In the Midway Plaisance the Natatorium Building is nearly finished and the tanks are being placed. The contractors will have this building ready for bathers in a couple of weeks. Most of the pile driving for the sliding railway is done and ground has been broken for the Moorish Palace. The right of way is being cleared for the Park Railway.

England's building is having its superstructure framed ready to raise and the site has been cleared for Ceylon's building.

The artistic features of the construction work grow without regard to bad weather. The casting of exterior covering is generally ahead of other construction on the buildings and the extensive statuary work is on time.

Work is now in progress on 16 State buildings. The ground for sites has been broken for the Maryland, Nebraska and California buildings. The others are advanced as follows:

Illinois, rough carpentry work done, exterior covering being placed, interior lathing done, east and west wings plastered, building roofed and entirely inclosed, and working on the dome; Indiana, frame work all up, placing roof; Massachusetts, frame work being raised; Ohio, frame work up and sheathed, roof on; Wisconsin, frame work done and roof finished; Pennsylvania, frame work up to the line of the second floor; New York, foundations in, laying sills and first-floor joists; Kansas, first floor laid and raising frame; Rhode Island, frame work rising, floor laid; West Virginia, under roof; Connecticut, frame work up and

working on roof; Montana, laying first floor; Maine and Delaware, placing foundations.

Visit of Russian Commissioners.

The Imperial Russian Commission, now visiting Chicago, consists of Alexander V. Dobronizki, C. de Ragonza Souschbeffsky and T. Ruthman. Mr. Dobronizki is the State Councillor and is the Commissioner General to the exposition. The other two gentlemen are his assistant commissioners and both of them are officers of the Imperial Ministry of Finance at St. Petersburg. These gentlemen have been sent by the Russian Government to the United States for the purpose of making the necessary arrangements concerning the organization of the Russian section at the World's Fair. The Director-General cordially welcomed them, and expressed to them how great was the gratification of the exposition authorities that the Russian Government should, in such a marked and official manner, participate in the exposition at Chicago.

After an interview with these visitors Chief Fearn said: "They are very enthusiastic. They tell me their Government will make a more brilliant and comprehensive display than it has at any previous exposition. I was very much struck myself in Europe in 1884 in examining the Russian section at the Antwerp exhibition. It was certainly very interesting and beautiful. These gentlemen tell me that their exhibit at Antwerp will be far surpassed by the display they will make at Chicago in 1893. Their exhibit will consist of bronzes and works of art. Malachite ornaments, in which they are unsurpassed, will be shown. Exhibits of minerals from the famous mines of the Ural Mountains, platinum, iron, &c., will be fully displayed. Their wonderful leather manufactures will have large space. The forestry exhibit will be very complete. The famous Orloff trotter and other fine breeds of their celebrated horse-flesh will be fully represented by a fine exhibit. In the agricultural department their display of cereals will be very complete. As an exception to the general rule, they are delighted with the space assigned them in the art department."

German Interest Aroused.

No European nation is taking more interest in the fair than Germany. All over that country the people are awake to the fact that in Chicago the greatest of all great expositions is soon to be held. Herr Schnarz Alquist, Art Commissioner from Germany, who is now in Chicago, says that thousands of Germans will visit Chicago next year.

Von Caprivi has written an open letter indorsing the fair, and asking the manufacturers of his country to make a showing which will not seem insignificant compared with the showing of the French and English.

The city of Hamburg will celebrate the four hundredth anniversary of the discovery of America by a local fair. American societies will be invited to participate.

The German Froebel Kindergarten Association will make a collective exhibit in Chicago next year. American instructors expect to gain much from this exhibit, which will include kindergarten materials, books, statistics and drawings.

The German Village Company, who will have an exhibit in Midway Plaisance, were recently incorporated in Berlin, with a capital of \$3,000,000.

The city of Ulm, celebrated for its hat industries, will make a collective exhibit at Chicago.

More than 160 art industry firms of Bavaria will have exhibits at the fair.

Their Goods May be Marked.

Director-General Davis has issued a circular which should set at rest all doubt in

the minds of intending foreign exhibitors as to their privilege of marking the selling price of their goods, both in bond and out of bond. That right is granted in explicit terms in the following communications addressed to the Secretary of State:

CHICAGO, ILL., June 29.—To the Honorable the Secretary of State, Washington, D. C.—Sir: The publication in England of the letter which I had the honor to address to the department, under date of March 11, 1892, in reply to the inquiries of Consul Augier of February 15, 1892, in behalf of certain woolen manufacturers of Rheims, has led to the inquiry from British manufacturers whether my letter was intended to revoke the permission previously given to foreign manufacturers to placard their exhibits with the prices at which they will be sold in bond.

The paragraph in my letter of March 11, 1892, which refuses permission to the manufacturers of Rheims to placard their prices as requested in the letter of Consul Augier was a mistake, and I desire, therefore, to have that letter revoked by authority of the Department, and the following statement sent out to consular officers as the correct ruling in the case:

"Foreign exhibitors in the World's Columbian Exposition will be permitted to state upon placards attached to their exhibits the prices at which said products will be sold at the place of manufacture, and also the price in bond and out of bond, or exclusive and inclusive of the customs duties in Chicago."

Asking that the same publicity be given by the Department to this correction as was given to my letter of March 11, 1892, I have the honor to be, very respectfully yours,

GEORGE R. DAVIS, Director-General.

Rare Treasures from Far India.

The opulent princes of India promise to send to the World's Fair curios and treasures from their palaces, and a number have signified their intention of visiting Chicago in person, surrounded by their retinue. This is the information which Consul-General Ballantine writes from Bombay. He says that not only the native princes, but influential merchants and manufacturers, are now fully awakened to the importance of representation at the exposition. The Maharajah of the province of Travancore wants to send to Chicago rare works of art, including carvings on ivory, paintings, lacquer and damask work, filigree work in silver, embroidery and lace.

The Prince of Biroda, the most influential potentate in Western India, told the Consul he would ship to Chicago an exhibit representing a value of not less than 10,000 rupees. In addition the prince intends to come himself and bring his brother with him.

The Prince Cutch wants to make a display of silver and gold articles, but desires first to know whether the articles will be returned. Consul Ballantine found a Hindoo in the country who has organized an excursion of 200 of his fellow countrymen whom he will bring to Chicago.

Royal Commission of England.

The Royal Commission of England has organized on a working basis and will now devote its efforts to perfecting the display to be made in Great Britain's name at the exposition. An executive committee has been recently appointed to supervise the work. It is composed of the commission's Finance Committee with the following additions: Sir P. Cuscliffe-Owen, Sir Frederick Abel, Sir Douglass Galton and James Drudge. The duties assigned to this committee are to investigate every detail of the home and foreign work of the commission. The secretary is the executive officer who collects all information to be passed on by the committee, which in turn is subject to the decisions of the entire commission. Instructions will be issued to the executive officer, Sir Henry Wood, who is now in Chicago on official business.

Demands for New York Space.

The allotment of space at the Columbian Exposition began in New York on the 1st inst. Edmund C. Stanton, secretary to the Commissioners of the First Judicial District of the City and County of New

York, said: "We have received up to date 550 applications for space at the World's Fair. The proposed exhibits include everything from cigars to carriages, from educational objects to toys. One exhibitor has applied for 2500 square feet. Those whose applications are already on file will have the benefit of an early choice. Future applicants will have to take what is left. But we shall endeavor to provide accommodations for all intending exhibitors. No charge is made for space."

Because of frequent inquiries relative to space, the New York World's Fair Commission has issued the following notice:

An apprehension seems to exist by many intending exhibitors at Chicago and from this State that they will be charged for space, which is not so, and a limited amount of power will be supplied gratuitously, which will be settled at time when space is allowed, and when the allotment of space is definitely settled.

Cannon Used By Columbus.

Two very rusty and very ancient-looking cannon, which look as though they had been buried several centuries, were received in Chicago last week. They were unmounted and were boxed up carefully. The two pieces were consigned to the World's Fair and listed in the way bill sent to the custom house as "scrap iron." This "scrap iron" came from Cuba and goes to make up what will probably be one of the most interesting exhibits at the fair. The two old cannon were secured by a United States naval officer detailed on World's Fair service, on the site of an old and abandoned Spanish fort on one of the West India Islands. It was on this island, history and tradition say, the son of Christopher Columbus built a fort to repel invaders, and the two cannon which came in yesterday were said to have been part of the armament of the fort. The guns were made in Spain and brought over in one of the vessels attached to the great navigator's fleet. The valuable relics will probably be a part of the Government exhibit at the fair.

Indiana's Plans for Its Exhibit.

B. F. Havens, the Executive Commissioner of the Indiana World's Fair Board, has taken an unusual step in his work. He has sent to the Director-General a statement of the progress being made in that State. Among other things, he says:

The Indiana World's Fair Commission has arranged the construction of the Indiana State Building so that it will be a great exhibit of Indiana's best building material, consisting of stone, hardwoods, glass and encaustic tile. The building will be one that will be a pride to the people of the State. Within the building will be a great picture gallery of Indiana's prominent people. The mines and mining exhibit promises to be one of the leading exhibits. The geological and archaeological exhibit will be a fine one. The best archaeological exhibit belonging to any private individual in the United States belongs to Joseph Collett of Terre Haute, and it is understood that he will loan it for exhibition. The manufacturers of the State will surpass their old competitors, the gas belt having revolutionized manufacturing in Indiana. The manufacturing, agricultural and educational exhibits from Indiana will be the greatest exhibits of the State. The Rose Polytechnic will make a fine exhibit. Purdue University, under the generous action of its trustees, and in charge of its able president, Smart, will make the best and greatest technical exhibit of any school in the country.

To Avoid Disputes Over Authority.

On Thursday the Board of Reference and Control adopted as a plan of settlement of the disputed authority between Director General Davis and the local board a report prepared by J. W. St. Clair, which

provides for the appointment of a Board of Administration. This board is to consist of two members of the National Commission and two of the Board of Directors, and have exclusive authority in all matters pertaining to the administration of the exposition next year. By the terms of the agreement the Director-General is given exclusive authority to deal with exhibitors. A new office, that of Director of Works, is created, and the incumbent has charge of the police and all branches of physical work. The Director-General, however, is empowered to make requisition upon the Director of Works for any service desired in connection with exhibitors. Appointments made by the Director of Works are subject to the approval of the Board of Administration. Any disputes arising between the Director-General and the Director of Works will be carried at once to the board and decided.

Terminal Charges Reduced.

At a conference between V. D. Groner, chairman of the Committee on Transportation, and E. P. Ripley of the Local Transportation Company and Traffic-Manager Jaycox, the terminal charge on exhibits was reduced from 8 cents to 6 cents per 100 pounds. This reduction was largely brought about through the request of Commissioner Groner. He thought 8 cents entirely too much, and as the terminal charges will be made both for the reception of exhibits and their return, the exhibitor is saved altogether 4 cents on each 100 pounds. This arrangement at present applies to the Illinois Central only, but it is the intention to make the same charge for handling cars over the Baltimore & Ohio entrance.

Sunday Closing in Some Shape.

Sunday closing in some shape seems to be fated for the World's Fair. With this news is something more encouraging in regard to the proposed Congressional appropriation. If the House fails to pass the Souvenir Coin bill there is a good probability that the Senate will put it on as an amendment to one of the regular appropriation bills. The House Committee on Rules has given informal assurance that a day will be granted for the discussion of the bill reported by the Duborow committee. More than this it cannot do, and if the supporters of the bill fail to get a vote within that time, their chances will be gone so far as original legislation in the House is concerned. Leading Senators who are friends of the exposition hope that the bill will pass the House as an original measure. Otherwise, they say, if the Senate originates it, objection will be made by Senators who do not care to have an additional appropriation charged up to the Senate. These objections will not keep the Senate from doing what it thinks is just to the fair.

The Pettigrew committee on Friday reported back Senator Palmer's bill, with the recommendation that it be referred to the Appropriation Committee and made an amendment to the Sundry Civil bill. This is as much as the World's Fair Committee could do, and is an indorsement of the measure. If the emergency arises the Appropriations Committee will report the bill as amended to the Sundry Civil or some other appropriation bill, but for the reasons given above its members think that the House should act first.

The bill as reported from the Pettigrew committee in its main features has few changes from the bill which is now on the House calendar. Instead of coining 10,000,000 half dollars the phraseology is changed so as to read \$5,000,000 in half-dollar coins.

The Sunday amendment, however, is something radical. It provides that "the

World's Columbian Exposition shall not be opened Sunday," thereby assuming the absolute authority of Congress over the fair.

Treasury Decisions.

Enameled Steel Ware.

Before the United States General Appraisers at New York, June 10, 1892. In the matter of the protests, 19,558-65, of Stransky & Co., against the decision of the Collector of Customs at New York as to the rate and amount of duties chargeable on certain enameled steel ware, imported per the vessels and on the dates named in annexed schedule. Opinion by Wilkinson, General Appraiser.

The merchandise is enameled steel ware. It was assessed for duty at 50 per cent., under paragraph 172, N. T., and is claimed to be dutiable at 45 per cent., under paragraph 171.

A representative sample of the goods produced by the importer is a cup glazed with a whitish color and with blue veins or sprigs scattered through the enamel.

We find that the merchandise is steel ware, enameled or glazed with more than one color, or ornamented, and we hold that it is specially provided for in paragraph 172. The decision of the Collector is affirmed accordingly.

Brass—Certain Alloy Not.

Before the United States General Appraisers at New York, June 10, 1892. In the matter of the protest, 10,377 b-3831, of Risdon Iron and Locomotive Works, against the decision of the Collector of Customs at San Francisco, Cal., as to the rate and amount of duties chargeable on certain bars of metal, imported per railroad, September 18, 1891. Opinion by Wilkinson, General Appraiser.

The merchandise consists of pigs or bars of metal. It was assessed for duty at 45 per cent., under paragraph 215, and it is claimed to be dutiable as brass at 1½ cents per pound, under paragraph 189, N. T.

The metal is an alloy of zinc, manganese and copper, zinc largely preponderating in quantity and value. It is not in fact brass, and is not commercially known as brass. The protest must therefore be overruled.

Metal Dies for Stamping.

Before the United States General Appraisers at New York, June 10, 1892. In the matter of protests, 12,018 and 12,258b, of O. G. Hempstead & Son, against the decision of the Collector of Customs at Philadelphia as to the rate and amount of duties chargeable on certain steel plates, imported per Cilurnum, May 20, 1891; Strait of Gibraltar, June 16, 1891. Opinion by Wilkinson, General Appraiser.

A sample of the merchandise is a metal bar about 10 inches long, 1 inch wide and 1½ inches high. A raised fancy design appears upon the upper surface. The goods were assessed for duty at 45 per cent., and are claimed to be dutiable under paragraph 180, N. T., which provides:

"Steel plates, engraved, stereotype plates, electrotypes plates, and plates of other materials, engraved or lithographed, for printing, 25 per cent. ad valorem."

We find that the bars in question are not similar to any of the articles covered by paragraph 180, but that they are in fact dies for stamping, and that they are known in trade as dies.

The protest is overruled and the decision of the Collector is hereby affirmed.

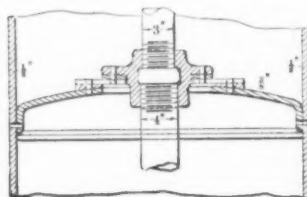
London papers are fondly expecting that the flow of gold from the United States to Europe will be reversed the coming autumn when the harvests ripen, but anticipate that on account of the unusually strong reserves of the American banks the demand for money to house the crops will be the more readily supplied from domestic sources. The situation, however, differs from that of former years in that no dependence can be placed on aid from the Government Treasury.

The Minerva Steam Boiler.

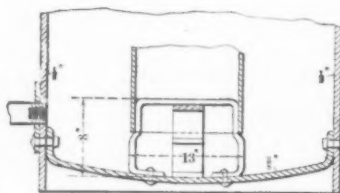
This generator is of the porcupine type, similar to the Hazelton, Hazelton Tripod and Climax steam generators, and is claimed to be an improvement over all of this class. It is built by the California Engineering Company of San Francisco. It comprises a vertical central column, with horizontal tubes radiating from it above all points above the fire box to the top, the size of the column, as well as the number, length and size of the tubes, determining the capacity. The trouble with boilers of this class, as sometimes made, has been found in the lower tubes filling up with sedi-

to jump into steam. It goes through the perforations of the outside pipe at the bottom, ascends on the outside of the outside pipe, and the water not going into steam returns down the space between the outside and the inside pipe. This keeps a constant circulation throughout the boiler.

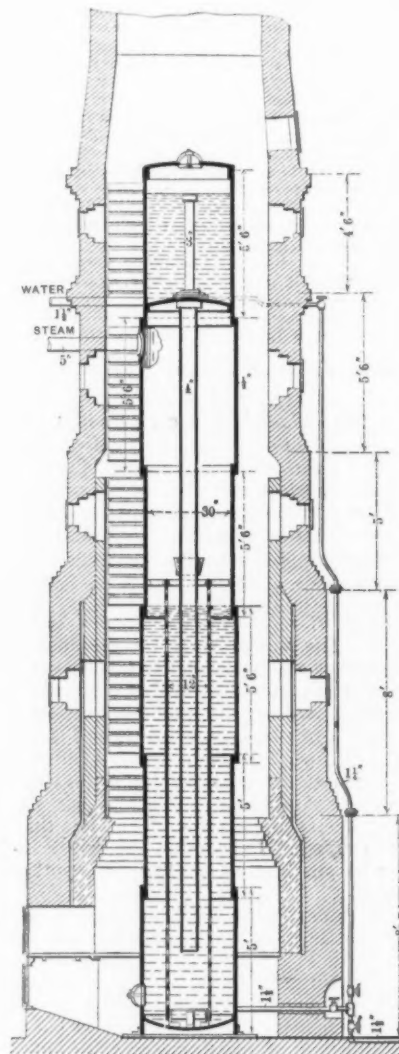
The top chamber will generally contain all of the sediment in the water, it settling there in the form of slush, where it is easily hosed out, there being no sediment whatever lodged on the lower tubes. The middle chamber with the radiating tubes is filled with steam, and this steam is superheated on account of the heat from the grates being so little expended by the



Section at Water Inlet.



Section at Bottom.



Vertical Section.

THE MINERVA STEAM BOILER.

ment, which caused them to be burned out and the boiler to prime. This was occasioned by the large column of cold water in the column and in the tubes, steam being generated so fast in the lower portion of the boiler that it had to raise the water in order to get out of the steam pipe.

The water heretofore has been fed into the bottom of the boiler, therefore the coldest part of the water was directly against the hottest part of the boiler. In the boiler here shown the water is fed in the bottom of the top chamber. It fills all the tubes in the top chamber, and rises to the level of the open pipe in the center of the top chamber. Above this pipe is steam room, where the entire surface of the water is subjected to the heat of the steam.

The water overflows in this pipe and proceeds to the bottom of the boiler ready

time it reaches those tubes, it having gone over such a small amount of water surface.

After superheating the steam it then strikes the cold water in the top department, sending the gases out of the stack at a temperature lower than the temperature of the steam going out of the steam pipe, thereby getting all of the heat into the water.

Since the introduction of these boilers into use there have been several cases where the water line has become low and the pumping of cold water has loosened up the tubes and ruined the boiler. This danger is obviated by the outside pipe leading from the bottom of the top compartment into the bottom of the lower compartment.

The water in the top compartment can be emptied almost instantaneously into the

lower compartment by the opening of the two valves shown in the drawing, which will be readily understood. By the manipulation of the three valves shown at that point the top or bottom compartment can be blown out or the safety used as described.

The method also brings the steam pipe out of the brick work at a very much lower point than heretofore used.

The principal claims made for the boiler are economy, great heating surface, durability and minimum space for horse-power required and exemption from priming.

THE WEEK.

Notwithstanding the defeat of the Government at Cincinnati and New York, the United States authorities at Chicago, on the return of Judge Gresham, will push the cases against the Whisky Trust officers, but the case is expected to go over until the fall term.

The Oliver Aluminum Company of this city are putting up a plant in Jersey City, where, in a few weeks, the public are to be invited to witness the extraction of pure aluminum from the clays of New Jersey, at a very low cost. One of the officers of the company predicts a "metallic revolution."

The winter wheat harvest has about closed and the yield will be good, while spring wheat promises an average crop.

Another bridge across the Missouri River at Omaha is proposed by the Nebraska Central Railway Company.

Two architects condemn the new immigrant buildings at Ellis Island as being insecure and inferior to the specifications.

The Beech Creek Railroad will be extended about 70 miles through the Clearfield region, at a cost of \$1,000,000, for the development of the coal fields.

The New York and New Jersey Terminal Company are pushing their scheme for a tunnel under Fourteenth street from the Hudson River to the East River, with branches to the lower part of the city.

The Reading Company, in the suit at Trenton, N. J., denies every charge respecting the alleged illegality and conspiracy of the so-called "combine."

The bill to provide for retaliation against Canada has been formally reported by Senator Davis from the Committee on Foreign Relations.

Mayor Grant appointed the following delegates to the second session of the National Mining Congress at Helena, Mont., July 12: John Stanton, Thomas L. Watson, Forest H. Baker, Evan Thomas. The silver question will be the principal topic discussed at the congress.

The Aqueduct Commissioners have received offers for the work of constructing the great Croton Dam at Cornells, as follows:

The Ryan & McDonald Construction Company of Baltimore.....	\$3,527,640
H. H. Brown.....	3,981,464
Michael S. Coleman.....	4,253,675
Winston, Crimmins, Washburn & Co.....	4,768,449
John McQuade and Joseph Moore.....	5,247,274
William Russell Allen & Co. of St. Louis.....	5,566,879

Chief Engineer Pteley had estimated that the work would cost \$4,574,800.

The new drawbridge across Newtown Creek at Laurel Hill, L. I., will cost \$100,000.

Sir Charles Tupper, the Canadian High Commissioner to England, proposed to the Commercial Congress in London that a small differential duty should be imposed by Great Britain and her colonies on for-

eign imports; but on two ballots his motion was voted down. Mr. Tupper is apparently much concerned about British trade. A few days ago in addressing the Chamber of Commerce in London he said there were risks of the octopus America throwing its tentacles over the West Indies and the Spanish Antilles with the view of driving out British trade, and it was going to do so. British consuls reported that Great Britain had lost Brazil, and that America was getting hold under her reciprocity system. The great relative increase of trade between Canada and the United States, as compared with Great Britain, is manifestly unsatisfactory, and tendencies in that direction must in some way be overcome. England cannot afford to lose her hold on the colonies.

Italy's imports of merchandise during the first five months of this year fell off 50,000,000 lire, compared with the same time last year, while the exports increased nearly 55,000,000 lire—the effect of good crops and reciprocity treaties with Germany.

An importer from Norway is in Chicago arranging for the direct shipment of American products to that country, instead of shipping via English ports.

The case of the United States against the lumber trust, better known as the Mississippi Valley Lumberman's Association, is up in the court at St. Paul.

An unexpected market for American corn has been opened in Mexico, which is receiving many carloads from Kansas and neighboring States, duty free.

Present indications are that Congress will adjourn July 15 or 20.

The permanent reciprocity arrangement with Cuba and Porto Rico, negotiated last year, took effect the 1st inst.

A letter from Rio expresses the opinion that the Argentine Government intends to carry out its purpose of entering into a reciprocity treaty with the United States, and adds that England has nothing to gain but much to lose through the success of such a measure.

France's last torpedo boat, No. 149, ran for two hours at an average speed of 24½ knots and a maximum speed of over 26 knots, with 342 revolutions.

A shipment over the Missouri Railroad comprises 40 carloads of grain drills for distribution in Kansas and western Missouri. These implements numbered 1600, and their weight was 1,500,000 pounds.

One of the effects of the formation of the Umbrella Trust has been to dispense with the services of about 75 per cent. of the salesmen employed by the various firms who have entered the combine.

The Louisiana Legislature are agitating anti-trust laws, having in view the suppression of the Rice Trust.

A company is being organized in England to establish a new fast steamship line between this country and Brean Down Harbor, on the Bristol Channel, England. The proposed capital is \$5,000,000, of which one half has been subscribed.

John W. Foster of Indiana is the temporary successor of Mr. Blaine as Secretary of State. He was formerly appointed as Minister to Mexico, again to Russia, and a third time to Spain. With two Fosters in the cabinet it will be necessary to discriminate.

According to the report of Consul Ryder of Quebec, the United States is wresting the import trade of Canada away from Great Britain. The imports to Canada from this country exceed by more than \$17,000,000 the imports from Great Britain and the British colonies, while the Canadian exports to Great Britain exceed by

more than \$12,000,000 Canadian exports to the United States. Canadians appreciate America for merchandise.

The suit of John O'Brien and Heman Clark, contractors, against the city to recover \$8,000,000 for extra work done on section 6 of the aqueduct was adversely decided by the Supreme Court.

Statistics of Germany's foreign trade for May show a large increase of exports over the figures for the same month in 1891. The exports for the first five months of this year show an increase of 600,000 tons, as against the exports for the corresponding period in 1891, and the imports for these months a corresponding decrease of 200,000 tons.

The whaleback steamer Joseph L. Colby is carrying fairly paying cargoes from points on the Gulf of Mexico and the Caribbean Sea to Boston and Providence. With 21 hands aboard it carries almost 3000 tons of Sisal hemp, and a cargo of cotton equal to those usually carried by steamers carrying from 28 to 32 hands. The difference in the consumption of coal for power purposes is proportioned in about the same way. The two differences are enough to make up almost the entire difference in cost between operating American and foreign vessels.

The lack of adequate warehouse facilities on the water front in New York City is an impediment to the growth of trade not easily overestimated and is likely to be long continued, on account of the difficulty in the city obtaining possession alike of the submerged land and the upland. Nearly all of the merchandise landed in New York by water is necessarily transported on trucks from the piers to the warehouses in the interior. New York is the truckman's paradise. It is estimated that there are upward of 35,000 trucks in use in the city, the yearly cost of maintenance of which is estimated at \$35,000,000. The direct result of this complete control of the traffic of the city by the truck, is that the business of handling merchandise is being rapidly transferred from New York to Brooklyn, the Jersey shore and Staten Island.

The Baron Hirsch experiment at Woodbridge, N. J., for the relief of Russian refugees promises but indifferent success. The settlement covers 5000 acres bought a year ago in the pines, back of Cape May. At present there are 57 families, of whom 63 are on their own farms, which cost the company about \$1200 each. The houses and outbuildings on each farm have cost \$550. Next year the colonists will produce a surplus for sale, but three years must pass before the question of success or failure is decided. The settlement at Montefiore, not far distant, is less encouraging.

The sales of loose leaf tobacco at Danville, Va., for June were 4,377,420 pounds, an increase of more than 1,000,000 pounds over the same month last year. For the nine months of this tobacco year the sales were 32,073,509 pounds, a falling off of 5,000,000 pounds as compared with the same time last year.

The Phipps Conservatory Commission of Pittsburgh have awarded the contract for the erection of the Phipps Conservatory to Lord & Burham of New York. The bid of this firm for the construction of the conservatory was \$101,334.45. This conservatory will be erected in Schenley Park, Pittsburgh, and all expenses connected with its erection will be borne by Henry Phipps of Carnegie, Phipps & Co., Limited. It will be built very close to the Carnegie Free Library, which is also to be erected at Schenley Park, for which Andrew Carnegie has given the city of Pittsburgh \$1,100,000 for the building of the library.

The Iron Age

New York, Thursday, July 7, 1892.

DAVID WILLIAMS, - - - PUBLISHER AND PROPRIETOR.
CHAS. KIRCHHOFF, - - - EDITOR.
GEO. W. COPE, - - - ASSOCIATE EDITOR, CHICAGO.
RICHARD R. WILLIAMS, - - - HARDWARE EDITOR.
JOHN S. KING, - - - BUSINESS MANAGER.

Season Contracts for Finished Iron and Steel.

Inside facts are now working to the surface with regard to prices being made on season contracts. Our market reports have of late made quite frequent reference to heavy orders from Western agricultural implement manufacturers for iron and steel to be delivered during the coming 12 months. These contracts are an important feature of the year's business with a number of the large Western rolling mills. The tonnage thus secured makes an excellent basis for the future, guaranteeing work for dull seasons as well as periods of activity, and such contracts are sought for with much avidity by certain mills having special facilities for handling the business. There was a time when comparatively few of them were equipped for turning out the special shapes and sizes required, and very lucrative prices were obtained. The agricultural works then paid a premium above the price of regular bars. That day has long since passed, and now this special material is subject to the same trade influences as ordinary merchant shapes.

At the beginning of the contract movement this year a strong effort was made to keep prices up. Makers of some classes of steel products were very successful in this respect, and the contracts taken by them were at a somewhat better price than they had been able to get on the same kind of business in 1891. This was encouraging, leading to the hope that other season contracts would also realize satisfactory figures for the iron and steel makers. But competition among the rolling mill companies, and especially among those making cheap Bessemer steel stock, was too keen to keep up prices. It now transpires that some of the recent large transactions were effected on a basis lower than anything heretofore known. Injustice would probably be done to the trade in general by publishing the special terms agreed upon in the cases under consideration, and we will merely say that bar-iron makers were wholly unable to compete in the matter of prices, even if they had been permitted to figure on the very poorest class of material. This, of course, they could not do, as the requirements for agricultural implements call for material of very good quality.

Pittsburgh and Ohio manufacturers, it is asserted, were completely barred out by rolling mills further West, whose appetite for these contracts has been sharpened by the taste they have had of them in the past two or three seasons. If the compe-

tition now in progress is continued, and extends into other classes of trade than among agricultural works, a readjustment of prices will be forced, in which Pittsburgh and the valleys will be compelled to drop to a lower level than they have thus far been willing to descend to, and steel will more than ever displace iron. It is, of course, possible that the low prices made on these recent contracts is the result of a fight between large Western concerns for business which each claims to own or control, but, whatever the special cause may be, the rates thus far made on some contracts will hardly be advanced on the others now under negotiation.

The consequences of this serious condition of trade in the West are numerous and important. Among them may be mentioned the following: 1. The Western mills are now disposed to make a wholly independent set of prices, without reference to the advantage they have in freights as a protection against mills further East. 2. A more serious blow has been given to iron in merchant shapes than at any previous time. 3. It is difficult to see how the rolling mills can now agree to pay the past year's wages scale when they have sold a large part of their output for the coming year at such an extremely low rate. The agricultural implement manufacturers again enjoy a peculiar conjunction of favorable circumstances—cheaper material than ever and a continued heavy demand for their products.

Rolling Mill Girls.

The people of the West are amazed at the following press dispatch printed in the Chicago papers of the 2d inst.:

PHILADELPHIA, Pa., July 1.—Rolling mill girls in this city, numbering upward of 1000, quit work last evening because of the refusal of their employers to sign the scale of wages that has been in use for several years, in which \$4.85 per ton was the basis of pay for puddling. The two firms affected are Hughes & Patterson and Gaubert, McFadden & Caskey.

It has been known that for a long time the gentler sex has been encroaching more and more on the territory once exclusively occupied by males, particularly in the East, but this is the first intimation that girls have been found adapted to the performance of rolling mill work. It must be an inspiring sight, indeed, to see these thousand girls, clad in neat and becoming dresses, with bangs and curls and high-heeled shoes, handling tongs and dexterously manipulating great masses of white-hot iron. We have inquiries from the West as to the peculiar causes which have led to this remarkable usurpation of man's work by woman, and are at a loss to assign a reason for it. The natural inference would be that it is because women work for less wages than men. But here we are confronted by the fact that these girls are striking for a maintenance of the men's wages scale, hence that cannot be the reason. Perhaps the rolling mill owners would be the best persons to explain, and we turn our inquirers over to them for full particulars.

Iron Making on the Hudson.

The stoppage of a number of the old plants on the Hudson River and the dismantling of others has led to the impression that pig-iron manufacture in this district is a declining industry. It has been quite frequently asserted that before many years had elapsed there would be very few active stacks left on the Hudson River. There seemed to be many facts to encourage that conviction. With the great stove industry of the valley crippled by the desertion or failure of some of its most active and largest firms, with the cessation of the manufacture of steel rails on a large scale, with vigorous competition growing up in other sections in some of its time-honored specialties, there appeared little chance for recovering lost ground or capturing new territory. Yet here, as elsewhere, the stress of the past years has developed the possibility of reaching cost figures hitherto undreamt of. The remodeling of some of the older plants has notably lowered the fuel consumption, until to-day 1 ton 3 hundred-weight is attained, as against 1 ton 7 hundredweight formerly. The improvement in furnace practice, with which Fred. Gordon has been largely identified, has brought the Hudson River anthracite furnaces up to the achievements in eastern Pennsylvania and elsewhere, so that to-day there are concerns making iron at less than \$14. But, perhaps, the most important result of the developments of the past year has been to give iron makers in this section a good deal more courage and confidence in the future.

We understand that there are now three different parties who have decided upon or who seriously contemplate the erection of blast furnaces on the Hudson River. The Poughkeepsie Iron Company, under the management of Albert Tower, will put up a modern stack, the Hudson Iron Company at Hudson, N. Y., will probably erect a furnace, and the Hudson River Iron Ore Company, in which the Burdens of Troy are so largely interested, will also build a new plant. We understand that the different concerns named expect with the latest plant and with modern practice to reach cost figures somewhere between \$12.50 and \$13.50 per ton. All of them have a good deal of ore property, and are experienced iron masters with ample resources, so that there is nothing that is visionary in their plans. They have no land schemes to promote, but have been in the business for generations and are simply preparing to stay in it.

Placarding Costs at the World's Fair.

Foreign exhibitors at the World's Fair at Chicago have been granted a privilege for which they contended in vain at the Centennial Exposition in Philadelphia. It is announced in the following ruling made the past week by Director-General Davis:

Foreign exhibitors in the World's Columbian Exposition will be permitted to state upon

placards attached to their exhibits the prices at which said products will be sold at the place of manufacture, and also the prices in bond and out of bond, or exclusive and inclusive of the customs duties, in Chicago.

Unless we are greatly mistaken, this ruling will awaken a chorus of protests from American manufacturers, and perhaps from merchants. The purpose is obvious. Foreign manufacturers desire to show how much the cost of their wares is enhanced to American consumers by the tariff. Such an attempted comparison with domestic prices, it will be seen, is unfair, for the reason that the foreign exhibitors would not add necessary expenses to be incurred in selling to American consumers. In the case of articles sold at retail, the retailers' profits cut a considerable figure in the cost to the consumer.

The growth of Chicago as a financial center is well shown by a statement just made public concerning disbursements for interest and dividends on the 1st inst. These disbursements in Chicago or on Chicago properties amount to more than \$12,500,000. This aggregate is made up of the following details:

Bank dividends.....	\$726,500
Street railway dividends.....	533,125
Street railway interest.....	325,188
Gas bonds.....	322,930
Gas dividends.....	312,500
Building bonds.....	202,950
Building dividends.....	23,500
Dividends miscellaneous companies.....	850,200
Interest miscellaneous bonds.....	764,034
Park and county bonds.....	67,175
City bonds.....	403,298
Real estate mortgages.....	1,572,000
Savings deposits.....	514,000
Total.....	\$6,707,400
Interest on railroad bonds listed on the Chicago Stock Exchange.....	4,250,000
City bonds maturing.....	1,500,000
Total.....	\$12,517,400

A considerable portion of the investments covered by these disbursements is unquestionably owned elsewhere and will therefore not be of special benefit to local interests. The same statement, however, can be made with regard to any financial center, whether in this country or abroad. It is sufficient to know that this large amount originates in Chicago, no matter what ultimately becomes of it.

OBITUARY.

JOHN H. SNYDER, at one time superintendent of the Albany Iron Works in Troy, N. Y., died June 26 at St. Louis, Mo., and his remains were interred in the Rural Cemetery, Albany. The deceased, while superintendent of the Albany Iron Works, had supervision of the rolling of the plates with which Ericsson's Monitor was built. He was an inventor of a number of railroad devices, and after leaving Troy he was superintendent of the Tredegar Iron Works at Richmond, Va.

WALTER STILLMAN, who for the past 27 years had charge of the percussion cap and sporting goods department of the Waterbury Brass Company's New York store, died suddenly of pneumonia, at his residence in Closter, N. J., on June 28. Mr. Stillman endeared himself to a large circle of friends in and outside of the trade by his integrity and genial disposition, and his loss will be severely felt by those who come in daily business contact with him, who had learned to appreciate him for his many good qualities. He leaves a widow and six children.

Vagaries of the Coal Trade.

It is an acknowledged fact in the anthracite coal trade that the Reading combine are actually in control, and that prices, subject, of course, to natural laws, are governed at will. For this reason there is a tacit acquiescence in the decisions of the combine by those within the charmed circle with reference to prices and output. At the same time, it is evident, from expressions frequently heard that there is more or less of suppressed dissatisfaction among the trade at large. For example, we have the advance in prices just announced by which the schedule on chestnut is put up 65 cents, and other sizes lessened in proportion—this, too, on July 1, a season always dull, when the market is supposed to be near the bottom, and therefore favorable to those who would provide for future wants. Not a few, even among influential operators, would be inclined to protest, and however warmly in sympathy would advise to "go slow." President McLeod of the Reading, successor of Mr. Gowen, reasons that the combine represents an enormous investment which must be made to return a fair interest on the capital; that coal can no longer be sold for less than cost, making due allowance for wear and tear, and that to bring about equilibrium and stability as between producers and consumers a steady advance in prices to a fairly remunerative point is inevitable. At the same time, to salve over matters, Mr. McLeod held out the expectation that eventually prices to consumers in Pennsylvania, including the large manufacturers, will be actually reduced. On this point he says that through the lease of the Lehigh Valley Railroad "the Reading will be able to operate both lines with greater economy than they could be operated separately, and through these economies will ultimately, be able to reduce the tolls on coal to the industries on our lines, as well as to more distant points." He would have it believed that by the equalizing process going on it will no longer be possible to buy anthracite after it has been shipped to remote points in Maine or Chicago for less money than is paid in the State where it is mined. There have been three distinct advances in price during the past three months. The following shows the July circular prices for the past three years:

	1890.	1891.	1892.
Grate.....	\$3.65	\$3.65	\$3.90
Egg.....	3.75	3.85	4.20
Stove.....	4.00	4.05	4.50
Chestnut.....	3.65	3.75	4.40

Not a few of the wholesale operators and dealers object to anything like rash or hasty measures, calling attention to the fact that high prices are liable to stimulate competition to an injurious extent. Bituminous coal is constantly crowding in and is already felt much more than it was. Besides, there is the competition of oil and gas stoves that is almost immediately felt as the result of high prices for anthracite. In regard to the threatened encroachments of bituminous coal it is known that extensions of the Beach Creek Railroad already in progress through the famous Clearfield region, under the Vanderbilt interest, will in a few months materially augment the supplies of this fuel. Similar moves are making in Virginia and other directions.

For all this, the fact remains that the policy marked out by the Reading management points to higher prices in the future for the general consumer, despite the heavy interests still remaining outside. The control of the coal fields is now in strong hands, and is claimed to comprise 80 per cent. of the aggregate output. Mr. Gowen for a number of years endeavored to gain the point achieved by his suc-

sors, but failed. The consequence was that, to relieve pressing financial necessities arising from time to time, coal was slaughtered for what it would fetch, the whole market following in a scramble for buyers.

In the present situation it is understood all round that litigation is threatened in several quarters. But a certain degree of presumption is indulged on account of the probability that in any event a few years must elapse before an adverse decision is reached in the Supreme Court. There are the proceedings instituted by the Attorney General of Pennsylvania, also by the Attorney-General of New Jersey. On the other hand, a committee of the New York Senate made a searching inquiry which thus far has amounted to nothing beyond eliciting considerable information. Thus far little has been done to thwart the schemes of those who assume that they are intent only upon placing the coal trade on a remunerative and, therefore, permanent basis, in no way inimical to the public interests. For an interval, therefore, and perhaps for a term of years, the coal trade is likely to remain substantially in the control of the combine—a fact which cannot well be ignored, and consumers will govern themselves accordingly.

PERSONAL.

Robert R. Zell is no longer connected with the active management of the Campbell & Zell Company, Baltimore, Md.

J. H. Bickley, Jr. has severed his connection with the Mechanical Engineers' Department of the Phoenix Iron Company, Phoenixville, Pa., and in the future will be connected with the Dover Iron Works of Dover, N. J.

The fourteenth meeting of the Foundrymen's Association of Philadelphia was held at the Manufacturers' Club last night. The subjects for discussion were "The Cost of Castings," as presented by Stockton Bates; the report of the Freight Committee, and a paper on "Iron for Commercial Purposes."

The rolling mills of Hughes & Patterson, Philadelphia, were shut down by order of the firm at 5 p.m., June 30. Anticipating an arrangement of their employees, the majority of whom are members of the Amalgamated Association, to cease work at midnight that day. The reason given is the refusal of the firm to sign the wage schedule. There are hopes of a *modus vivendi* being arrived at in order that the mills may commence operations again in a week or two. Hughes & Patterson employ between 400 and 500 hands. It is anticipated that the Fairhill Rolling Mills of Philadelphia may follow suit, should an amicable arrangement with their workmen not be attained.

The firm of E. Morewood & Co., Swansea and Llanelly, Wales, have completed arrangements for starting a large works at Gas City, Ind. It is their intention to begin immediately on the plant, which will consist of four mills, and which will be increased to eight mills later. The company will have their own Siemens-Martin steel furnaces and rolling mills. Mr. Rogers, the manager, has been in the United States for some weeks, but returns to Wales the last of this month, having completed his preliminary arrangements for the erection of the works here.

The Brooklyn City Railroad Company have contracted for the erection of a trolley power station 700 feet long by 200 feet wide, to cost about \$300,000.

The Shut Down at Pittsburgh.

On the night of June 30 the Amalgamated Association scale of wages governing wages in rolling mills west of the Allegheny Mountains expired, and as no agreement had been arrived at between the Conference Committees of the manufacturers and the Amalgamated Association a shut down of the mills took place, and at this writing all are idle except a few that signed the scale. As we announce elsewhere, a settlement has been arrived at between the Amalgamated Association and the Association of Iron and Steel Sheet Manufacturers, and as a result of this all sheet mills in the West will continue in operation right along, with the exception of those that will close down to make necessary repairs.

In regard to the iron mills, it was the general impression that a peaceful settlement of the wage scale might be accomplished before the old scale expired, but this has not proven to be the case. A number of conferences were held at Pittsburgh between the manufacturers and the workmen, full accounts of which have already been given in these columns, but no results were attained looking to a settlement of the wage scale for another year. All hope of a peaceful settlement had not been abandoned until the day the old scale expired, for the reason that early last week a communication was received by the officials of the Amalgamated Association from a number of the Pittsburgh manufacturers requesting a conference on Friday, July 1. This request was agreed to by the Amalgamated Association, and it was held in the Ferguson Building, Pittsburgh, on the afternoon of July 1, and was in session for four or five hours. About the same arguments were advanced by the members as had been given in previous conferences as to why the wages scale formulated by the Amalgamated Association for the year 1892-93 could not be signed by the Pittsburgh manufacturers. Both sides of the case were presented in detail by the members of the respective committees, but, as was the case with the other conferences, nothing was accomplished. It was thought that the manufacturers would present a scale at the meeting on Friday which would be in the nature of a compromise and would be based on boiling at \$5 per ton, with about 10 per cent. reductions in other departments. This was not done, however, the manufacturers insisting that the original scale as presented by them based on \$4.50 per ton for boiling on a 2-cent card must be accepted. There is no doubt whatever that the attitude of the Pittsburgh manufacturers has been in the nature of a great surprise to the officials of the Amalgamated Association, and the tenacity with which they insist on the adoption of the original scale has probably had the effect of making the officials of that organization realize that when the scale was originally presented it was not in the nature of a bluff, as had been charged. The conference of Friday adjourned with the understanding that another conference will be held in Pittsburgh on Wednesday, July 6, at the same place. It is possible that some understanding will be arrived at when this conference has been held, but the impression is growing that a conflict among the iron mills is bound to take place. It is a remarkable fact that up to this time there is not a concern in Pittsburgh that has signed the Amalgamated Association scale that will in any way have an influence with the other manufacturers in inducing them to sign. A number of the Western mills have signed the scale, and one or two Pittsburgh concerns that have always made it a practice heretofore to sign the scale as soon as presented, but at

this writing only the following-named firms have signed the Amalgamated scale for 1892-93, with the understanding, however, that when the final adjustment has been made they will be allowed to participate in any concessions that are made to the other manufacturers. The list of signers comprises the following firms: Harris Rolling Mill Company, Irondale, Minn.; Chartiers Iron & Steel Company, Limited, Pittsburgh, Pa.; Cleveland Hardware Company, Cleveland, Ohio; Cincinnati Rolling Mill Company, Cincinnati, Ohio; Muskegon Iron & Steel Company, Muskegon, Mich.; Upper and Lower Union Mills of Carnegie Steel Company, Limited, Pittsburgh, Pa.; Scottdale Iron & Steel Company, Scottdale, Pa.; Kansas City Bolt & Nut Company, Kansas City, Mo.; Mitchell, Tranter & Co., Cincinnati, Ohio; Muncie Nail Company, Muncie, Ind. In addition to the above, the Oliver Iron & Steel Company of Pittsburgh signed the Amalgamated scale for their wire nail factory.

Since the above was written there have been several more signers to the Amalgamated Association scale, consisting of the following firms: Indiana Iron Company, Muncie, Ind.; Bristol Rolling Mill Company, Bristol, Pa.; Detroit Steel and Spring Company, Detroit, Mich.; Duluth Mfg. Company, Duluth, Minn. All signatures being attached to the Amalgamated Association scale are with the understanding that signers will be allowed any concessions made when the scale is finally adjusted.

The Lockout at Homestead.

On the night of Wednesday, June 29, the entire plant of the Homestead Steel Works of the Carnegie Steel Company, Limited, was closed down for an indefinite period on account of the refusal of the workmen to sign the new scales prepared by the firm. These new scales were printed in *The Iron Age* of June 16, and are to govern wages in the 119 inch plate mill, the 32-inch beam mill and the open-hearth department. These new scales were to supersede the old scales which expired on June 30, 1892, after being in operation for three years, or from July 1, 1889. The old scales were based on the selling price of 4 x 4 billets, the minimum being \$25, below which price wages could not go. During the three years that this scale was in force the maximum selling price of billets was \$37.50 per ton, which was the price quoted in *The Iron Age* of January 23, 1890, while the lowest price touched was \$22.25, a sale of 1000 tons at \$22.28 having been reported in the Pittsburgh market report in *The Iron Age* of June 2. During the three years this scale was in force it was the custom of the firm to ascertain the average selling price of billets for each three months as soon as they expired and wages for the following three months were then based on this average. The highest average reached in any one quarter was the first quarter of 1890, the average selling price of billets for January, February and March of that year having been \$34 per ton. During the prevalence of these very high prices the wages of the men were advanced very rapidly. In the second quarter of 1890 the price of billets commenced to decline and at the close of that year they were selling in Pittsburgh at \$26 per ton, as reported in *The Iron Age* of December 25, 1890. During the year 1891 the average selling price of billets at Pittsburgh was about \$26. During the first week in January, 1892, billets were selling at \$25 in Pittsburgh, while in the last week in May they were down to \$22.25. From the above it will be seen that for some time

past the firm have been paying wages based on billets at \$25 per ton, while they have been selling at about \$2.50 per ton less than that price. During the time that the old scale was in force the Homestead Steel Works have been practically rebuilt in many departments, and machinery was thrown out that in many other plants would continue to do service for years to come. Hundreds of thousands of dollars were expended in equipping the plant with the most modern machinery that could be obtained, both in this country and from abroad. The introduction of this machinery has naturally led to an enormous increase in the capacity for production, and as the men work altogether on a tonnage basis, they have been enjoying large increases in wages for months past. To carry out the assertion regarding increase in production, we have only to say that the new beam mill at Homestead is so admirably equipped that it can supply the requirements of the whole country for beams and channels. Several months since the officials of the Carnegie Steel Company, Limited, set about to prepare scales governing wages in the Homestead Steel Works which would be equitable in every respect and which would conform to the changes made in the plant by the introduction of new methods and appliances. It was decided that only in those departments where the tonnage had been greatly increased would a reduction be made. It was also decided to reduce the minimum of the scale from \$25 to \$22 for 4 x 4 inch billets in order to conform to the price at which they were being sold in the open market right along, and also to have the new scale expire on the last day of the year, or on December 31, 1893, instead of the last day in June, as heretofore. The reason given by the firm for deciding on this last change was the fact that during the last week in the old year and the first week in the new it has always been the custom to make repairs at the Homestead plant. When the new scales were presented to the men the firm announced that they would meet a conference committee of their employees at any time up to June 24 for the purpose of discussing the new scales. On Friday morning, June 24, a conference was held at Pittsburgh between members of the Carnegie Steel Company, Limited, and their employees, a report of which appeared in *The Iron Age* of June 30. At this meeting the firm agreed to advance the minimum base of the scale from \$22 to \$23 for 4 x 4 inch Bessemer billets, while the men would agree to a reduction of only \$1 per ton, or \$24 as the base price. The conference adjourned without any settlement being made, and as a result the firm closed down the entire plant as stated above, and at this writing not a wheel is being turned. The above is a correct statement of the causes which have led to the present trouble at the Homestead Steel Works, and which promises to be one of the bitterest labor fights that ever took place.

In support of our statement that the tonnage of the different departments where reductions are made in the new scale has been greatly increased we have been furnished a statement by the Carnegie Steel Company, Limited, which proves this assertion beyond a doubt. This statement was in our possession last week, but was received at such a late hour that we were unable to make use of it until now. From the figures furnished by the firm we learn that the average monthly production of the 32-inch slabbing mill for the last five months of 1889 was 7681 tons; of the 119-inch plate mill, 3458 tons, while the production of the open hearth department was 20 tons per turn per furnace. The output of the 32 inch slabbing mill for May of the present year was 9265 tons; of the 119-inch plate mill, 5268 tons, and the production of the open-hearth department

by the introduction of new methods has been increased to 23½ tons per turn per furnace. This shows an increase of output of 1584 tons per month in the 32-inch mill, or nearly 21 per cent.; 1810 tons in the 119-inch mill, or 52 per cent., and 3½ tons per turn in the open hearth department, or a little more than 17 per cent. These increases, of course, made a corresponding increase in the wages of the men. A mistaken impression exists as to the wages the men would have received had they accepted the new scale proposed by the firm, as compared with the wages they received while working under the old scale. In order to correct this false impression, we append below a table furnished us by the firm, which shows the old rates of wages as compared with those called for by the new scale, as follows:

	1890-92 scale.		Proposed 1892-93 scale.		
	\$20.50 basis.		\$26.50 basis.		\$23 basis.
12 hours. 32-inch slabbing mill.	Rate 100 tons.	Daily earnings.	Rate 100 tons.	Daily earnings.	Minimum basis.
Heater.....	\$4.31	\$6.37	\$4.31	\$7.68	\$6.67
Screwman.....	4.61	6.81	.....	.....	4.41
Heater, 1st helper.....	3.07	4.53	3.07	5.47	4.75
Heater, 2d helper.....	1.73	2.56	1.47	2.62	2.27
Craneman.....	2.23	3.29	1.33	2.37	2.06
Roll engineer.....	2.50	3.69	.....	.....	3.24
Roll tableman.....	2.50	3.69	1.00	2.85	2.47
Sweepers.....	1.54	2.27	1.0	2.14	1.86
Shear tongman.....	1.54	2.27	1.25	2.23	1.94
Stamper.....	1.40	2.17	1.32	2.37	2.06
Shearman.....	2.50	3.69	.....	.....	4.00
Shear tableman.....	1.73	2.56	1.47	2.62	2.27
Bugymen.....	1.54	2.27	1.25	2.23	1.94
119-in. plate mill:	12 Hours.	8 Hours.	12 Hours.	8 Hours.	
Roller.....	\$14.00	\$9.31	\$14.00	\$9.45	\$8.20
Screwman.....	11.50	7.67	11.00	7.49	6.45
Tableman.....	10.10	6.65	8.00	5.40	4.69
Hooker.....	8.50	5.66	7.00	4.73	4.11
Sweeper, front.....	6.00	4.50	5.00	3.78	2.93
Sweeper, back.....	5.50	4.56	5.00	3.78	2.93
Shearman, 1st.....	13.00	8.66	11.00	7.43	6.45
Shearman, 2d.....	8.50	5.66	8.00	5.40	4.69
Leader, 1st.....	7.75	5.16	6.00	4.05	3.12
Leader, 2d.....	7.25	4.83	5.00	3.78	2.93
Heater.....	22.00	14.06	11.00	7.43	6.45
Heater's helper.....	15.00	10.10	6.00	4.66	3.52
Open-hearth furnaces:	12 Hours.	8 Hours.	12 Hours.	8 Hours.	
Melter's helpers, 1.....	\$18.00	\$3.60	\$16.00	\$3.77	\$3.26
Melter's helpers, 2.....	15.00	3.00	13.00	3.06	2.66
Charging mach.....	15.00	3.10	14.00	3.29	2.86
Ladleman, 1.....	17.00	3.40	16.00	3.78	3.26
Ladleman, 2.....	14.00	2.80	13.00	3.06	2.66
Pitman, 1.....	17.00	3.40	16.00	3.78	3.26
Pitman, 2.....	14.50	2.90	13.00	3.06	2.66
Pitman, 3.....	13.50	2.70	12.00	2.83	2.45

These tables show old rates of wages and proposed rates of wages in all departments, and also in all positions where reductions were proposed, and a careful study of them will show that under the new scales the workmen would be about as well or better off than they were under the old. In addition to this, a reduction in hours has been made in the open-hearth department and also in the 119-inch mill.

At this writing there are no new developments regarding the situation at Homestead. No move so far has been made by the firm toward securing new men, and none is expected to be made for some little time yet, as repairs are actively going on at the Homestead Steel Works. The employees, however, are making demonstrations daily, and have even gone so far as to hang in effigy a number of the officials of the firm. Should an attempt be made to introduce new workmen into the plant it will, no doubt, be violently opposed by the locked-out employees and serious trouble may occur. The entire plant at Homestead has been put in as secure a position as possible in order to withstand any attacks that may be made on it by discharged workmen. A number of mass meetings have been held by the workmen, and speeches of a very strong nature have been made. The men insist

that under no circumstances will they return to work under the scale proposed by the firm, and that any attempts made by the firm to start the plant with imported workmen will result disastrously. A number of extra deputy sheriffs have been sworn in at Homestead, and the best citizens of the town have expressed the determination to maintain order at all hazards. The situation is certainly critical, and it is to be regretted that the men were not far-sighted enough to see what was to their own interests and arrange an amicable settlement with the firm. It is feared now that should they attempt to make a settlement they will be unable to secure as favorable terms from the firm as they would have secured had they showed a spirit of concession when the first conference was held.

(Telegraphic Report of the Homestead Troubles will be found elsewhere.)

Cuban Reciprocity.

The new permanent reciprocity agreement between the United States of America and Spain will go into effect on July 1, on and after which date articles of merchandise produced in our country will be admitted into all the established ports of entry of the Spanish islands of Cuba and Porto Rico, in accordance with the schedules given below. The officer in charge at the Spanish Consulate in New York said recently: "It will be necessary for the manufacturers, producers and merchants who wish to take goods into Cuba and Porto Rico to make a declaration that the merchandise is produced in the United States. This declaration must be in writing, signed and attested. Every possible precaution will be taken to prevent goods manufactured in other countries from being taken via the United States into Cuba and Porto Rico under the concessions granted in the reciprocity arrangements." Schedules follow:

Schedule A.

Products or manufactures of the United States to be admitted into Cuba and Porto Rico free of duties:

10. Iron, cast in pigs, and old iron and steel.
11. Iron, cast in pipes, beams, rafters and similar articles, for the construction of buildings, and in ordinary manufactures. (See repertory.)

12. Iron, wrought, and steel, in bars, rails and bars of all kinds, plates, beams, rafters and other similar articles for construction of buildings.

13. Iron, wrought, and steel, in wire, nails, screws, nuts and pipes.

14. Iron, wrought, and steel, in ordinary manufactures and wire cloth manufactured.

25. Implements, utensils and tools for agriculture, the arts and mechanical trades.

26. Machines and apparatus, agricultural, motive, industrial and scientific, of all classes and materials, and loose pieces for the same, including wagons, carts and handcarts for ordinary roads and agriculture.

27. Material and articles for public works, such as railroads, tramways, roads, canals for irrigation and navigation, use of waters, ports, lighthouses and civil construction of general utility, when introduced by authorization of the Government, or if free admission is obtained in accordance with local laws.

28. Materials of all classes for the construction, repair in whole or in part of vessels, subject to specific regulations to avoid abuse in the importation.

Schedule C.

Products or manufactures of the United States to be admitted into Cuba and Porto Rico at a reduction of duty of 50 per centum:

49. Iron, cast, in fine manufactures or those polished, with coating of porcelain or part of other metals. (See repertory.)

50. Iron, wrought, and steel, in axles, tires, springs and wheels for carriages, rivets and their washers.

51. Iron, wrought, and steel, in fine manufactures or those polished, with coating of porcelain or part of other metals, not expressly comprised in other numbers of these schedules, and platform scales for weighing. (See repertory.)

52. Needles, pens, knives, table and carving, razors, penknives, scissors, pieces for watches and other similar articles of iron and steel.

53. Tin plates in sheets or manufactured.

54. Copper, bronze, brass and nickel, and alloys of same with common metals, in lump or bars, and all manufactures of the same.

55. All other common metals and alloys of the same, in lump or bars, and all manufactures of the same, plain, varnished, gilt, silvered or nicked.

60. Rubber and gutta percha, and manufactures thereof, alone or mixed with other substances (except silk), and oil cloths and tarpaulin.

Schedule D.

Products or manufactures of the United States to be admitted into Cuba and Porto Rico at a reduction of duty of 25 per centum:

64. Rope, cordage and twine of all kinds.

65. Colors, crude and prepared, with or without oil, inks of all kinds, shoe blacking and varnishes.

Changes in Sheet Scale.

As we announced in *The Iron Age* of last week, a final conference between the Conference Committees of the Amalgamated Association and the Association of Iron and Steel Sheet Manufacturers was held in Room 710, Times Building, Pittsburgh, on Wednesday evening, June 30. At this meeting the several points of difference that existed between the manufacturers and the workmen regarding the sheet scale were amicably adjusted and a scale governing wages in sheet mills in Pittsburgh and the West was formulated. The following changes were made throughout the scale:

In the notes to the mill scale the eighth, ninth and eleventh paragraphs now stand:

8. Sheet and jobbing mills working three turns, the shearing shall be divided between two shearman on jaw, crocodile or rotary shears, and no shearman be allowed to shear more than two turns on jaw or crocodile shears, with maximum not to exceed three turns on squaring shears.

9. That shearman on jaw, crocodile or rotary shears receive one-fifth of the above prices, the same to be paid by the roller. That on sheet mills using modern squaring shears, the price for shearing shall be one-seventh. (The difference between one-seventh and one-fifth for shearing to be retained by the company.) Shearing to mean squaring the pack.

11. Sheet mills working three turns that make tin and black plate shall be permitted to make three turns of eight hours each, of nine heats each turn.

In the sheet-mill hands' scale the only change is in the following paragraph:

2. This scale of wages is based on 180 pairs per ton for single mills and No. 25 gauge and lighter, doubled in pairs, 96 pairs per turn; doubled in threes, 105 pairs per turn. Single iron, 14 to 19 gauge, inclusive, 105 pairs.

The classification of work adopted is as follows:

Number of Pairs per Turn.

Gauges.	Doubling mills.	Single mills.	Doubled in pairs.	Doubled in threes.
Nos. 14 to 19.....	.....	105	.....	.....
No. 20.....	84	180	.....	.....
No. 21.....	84	180	.....	.....
No. 22.....	84	180	.....	.....
No. 23.....	84	180	.....	.....
No. 24.....	84	180	.....	.....
No. 25 and lighter.	105	180	90	105

In connection with the adoption of the sheet scale, it should be noted that in all sheet mills where boiling is done the manufacturers agreed to pay prices for boiling, and also in the finishing departments, based on the new scale of the Amalgamated Association. When a wage scale governing rolling mills is finally adopted, the sheet manufacturers will be allowed any concessions that may be made by the Amalgamated Association when the new scale is put in force. It is a matter of congratulation that a peaceful settlement, as far as sheet mills are concerned, has

been arrived at, and the gentlemen who represented both the manufacturers and the Amalgamated Association are to be congratulated on the spirit of concession shown by them at every conference that was held between the Amalgamated Association and the committee representing the Association of Iron and Steel Sheet Manufacturers.

THE MINING ENGINEERS.

From Tuesday until Saturday of last week the American Institute of Mining Engineers held the summer session on Lake Champlain. The meeting really began on Tuesday morning at the southern end of Lake George, where many of the members collected and made a delightful and profitable excursion together by steamer to the head of Lake George and from Fort Ticonderoga, again by steamer, up Lake Champlain to the headquarters at Bluff Point, where the Hotel Champlain had been opened in advance for the meeting.

Among those present were: Frank S. Witherbee of Witherbee, Sherman & Co. of Port Henry; A. C. Inman of the Chateaugay Iron Company; James Hall, State Geologist of New York; Dr. F. J. H. Merrill, Curator of the Museum of Natural History, Albany, N. Y.; Prof. T. Swineford Smith of the New York State Geological Survey, Buffalo, N. Y.; Prof. John C. Smock, State Geologist of New Jersey, Trenton, N. J.; M. C. W. Langdon, superintendent of the furnaces at Port Henry, N. Y.; John Birkinbine, Philadelphia, president of the institute; Dr. R. W. Raymond, Brooklyn, N. Y., secretary; Theodore D. Rand, Philadelphia, treasurer; Dr. Thomas M. Drown, professor of chemistry, Massachusetts Institute of Technology, Boston, Mass.; E. V. d'Inwilliers, Philadelphia; Justice Cox, Jr., Philadelphia, Pa.; W. G. Neilson, Philadelphia, Pa.; William Morris, president of the Pottstown Iron Company, Pottstown, Pa.; Oliver Williams of the Catsauqua Mfg. Company, Catsauqua, Pa.; Dr. Charles P. Dudley, chemist of the Pennsylvania Railroad Company, Altoona, Pa.; William L. Sheaffer and Arthur W. Sheaffer, of Pottsville, Pa.; John Thomas, Thomas Iron Company, Catsauqua, Pa.; B. F. Fackenthal, manager of the Durham Foundry, Riegelsville, Pa.; Wm. Thaw, Jr., Pittsburgh, Pa.; W. S. Scaife, Pittsburgh, Pa.; Prof. S. F. Emmons and Dr. D. T. Day, U. S. Geological Survey, Washington, D. C.; Dr. B. E. Fernow, Chief of the Division of Forestry, U. S. Department of Agriculture; E. Gybbon Spilsbury, Trenton Iron Company, Trenton, N. J.; John A. Walker, manager of the Joseph Dixon Crucible Company, Jersey City, N. J.; J. F. Holway of Henry R. Worthington, New York; Axel Sahlin, New York; William Kent, New York; W. H. Hoffman, Brewster, N. Y.; J. M. Shervord of the Troy Steel and Iron Company, Wm. P. Mason, H. S. McClelland and Charles McCreary of Troy; W. S. De Camp, Lyons Falls, N. Y.; C. G. Buchanan, New York; George H. Hewitt, Aspen, Col.; F. L. Clerc, Joplin, Mo.; Edward H. Sanborn, editor of the *Manufacturers' Record*, Baltimore; W. H. Case, Bertha, Va.; J. E. Johnson, Longdale, Va.; P. N. Moore, G. L. Foote, St. Louis, Mo.; Per Larsen, Norway, Mich.; Prof. F. F. Sharpless, Houghton, Mich.; and W. E. Hopper, manager of the graphite mines of Fort Ticonderoga, and a large number of ladies.

TUESDAY EVENING.

President Birkinbine called the Institute to order at the Hotel Champlain, and introduced Frank S. Witherbee, who as

chairman of the local committee gave the institute a hearty welcome. He referred to the historical interests of the region, Fort Ticonderoga, Burlington, Plattsburg and Fort Frederic, and then noted the changes in the technical interests in the Champlain region since the institute met here 14 years ago. Since then more iron ore (8,000,000 tons) has been mined than in all previous history, and more ore is concentrated at the Chateaugay Mine than in any other mine in the land. The Catalan forges have given way to blast furnaces, and mines are equipped with air compressor drills and electric lights, and magnetic separation is now working out the problem of saving the leaner magnetic ores.

After a pleasant response to this welcome by Dr. Raymond, the business of the meeting began with President Birkinbine's address, from which we take the following:

The President's Address.

EASTERN PENNSYLVANIA.

In the eastern district of Pennsylvania the lean brown hematite mines, while not exhausted, now contribute but a comparatively small part of the total ore consumption. The expense of exploitation in the mines of New Jersey and of southern New York, the necessity of roasting many of these ores, does not indicate a cheap supply from this source, unless it be obtained in part by magnetic concentration. Although the Cornwall ore shows the heavy demands made upon the deposit in later years, there is evidently ore enough for the near future, and the probabilities are that discoveries may increase the quantity when such ore is required, but the comparative leanness of this ore and the necessity of roasting it work to its disadvantage.

Abundant supplies of magnetic ores can still be obtained from New York State, supplemented by some excellent red hematite. The Lake Champlain district, which has up to the present contributed a total of about 16,500,000 gross tons, and southern New York will still supply ores for eastern Pennsylvania, and the recent developments on the western flank of the Adirondack Mountains encourage the belief in additional ore reserves being obtainable through the medium of concentrating machinery. There would, therefore, seem to be some reason for anticipating a marked decline in the output of eastern Pennsylvania, and on the other hand, there seems less reason to anticipate a greater increase in that locality than in eastern New York. Improved railroad facilities should give opportunity for assembling in the vicinity of the Hudson River New York ores to be smelted by northern Pennsylvania coal, producing pig iron close to a good market.

The importations of foreign ores, which in 1892 amounted to 912,864 gross tons, and in the past five years have reached a total of 4,895,038 gross tons, have a marked influence upon eastern Pennsylvania furnaces, and this influence will continue to affect the iron industry of that district, as well as that of New York, New Jersey, Maryland and other Atlantic States.

PITTSBURGH AND CHICAGO.

The source from which the Pittsburgh district and the Chicago district draw their ore supplies, the Lake Superior region, has been contributing iron ores since 1856, and doing this on a liberal scale since 1867, a total of 50,000,000 gross tons having been taken from the mines of the four ranges included in that region—the maximum amount shipped having reached 9,000,000 gross tons in 1890. The number of important producers which continue to contribute iron ore liberally for a term of years, the knowledge of new discoveries each year adding to the ore reserves, and

the millions of capital vested in the Lake Superior region in mines, railroads and in shipping docks, supplemented by other millions in vessels and receiving docks, would indicate that the supply from this source does not promise an early exhaustion. The Connellsville and other Pennsylvania coal fields relied upon by the Pittsburgh and Chicago districts for coke also give little anxiety as to its future supply.

BIRMINGHAM.

Neither does there seem any immediate prospect of either the coal or the ores in the vicinity of Birmingham becoming exhausted, but the large increase in the number of furnaces will rapidly deplete the easily won leaner ores, of which the greater quantities must be mined to produce a ton of pig iron than where, as a rule, the veins or beds are richer, as is the case in the Lake Superior region, and although the Alabama ore supply is great, the heavy drafts upon it may add so much to the cost of mining as to seriously detract from other local advantages. It is probably practicable to augment the local ore supply of the Alabama section in quantity and improve the average yield of the ore by using known deposits of iron ores in Cuba.

While neither of the four districts now producing pig iron largely gives promise of early restriction of output, the blast furnaces in eastern Pennsylvania to day largely depend upon New York, New Jersey, Lake Superior and foreign ores to enrich their depleted local mixtures. The Pittsburgh district must continue to bring ores long distances, the Chicago district will have to convey both fuel and ore hundreds of miles, and the Birmingham district with coal and ore convenient will have to mine and consume a greater quantity of each to produce a ton of metal than either of the other districts named.

It would seem that, as even with the best of ores used $1\frac{1}{2}$ tons are required to make 1 ton of pig iron, while the consumption of coke is often less than 1 ton, it would be better to manufacture pig iron at Lake ports and be cheaper to transport less than 1 ton of coke than to haul $1\frac{1}{2}$ tons of ore, but it is here that the local market for the pig iron of the Pittsburgh district is such an important factor. Similarly it would seem economy to assemble the raw materials where the haul of coke would cover less distance than from the Connellsville region to Chicago, but the same commercial reason holds true there.

The rapid development of the western portion of our country, particularly that which is tributary to or can be easily reached from the Great Lakes, may divert from Chicago and vicinity part of the future iron production to points nearer the ore fields, and yet within convenient reach of cheap transportation for the fuel. Whether this fuel will be transported in its raw state and coked at the blast furnaces, or whether it will be conveyed as coke, is a problem in process of solution, but I confess to feeling a gratification that the enterprise which I had the privilege of suggesting five years ago—viz., the erection of a blast furnace at Duluth, Minn., in which Minnesota ores are smelted by the use of coke made near at hand from Pennsylvania coal carried by vessel to the head of Lake Michigan—has been sufficiently successful to encourage other Lake ports to seriously consider the advisability of carrying out a similar project.

LOCAL AND DISTANT MARKETS.

A local market is an incentive for trade, and transportation charges for 600 miles are not proportionately greater than for 200 miles. It is due to the latter that coke can be sent to Chicago, ores to Pittsburgh and eastern Pennsylvania, and it gives a reason for the advancement of the

Birmingham district of Alabama, for the product of the furnaces of Alabama has reached points so far removed that were it not for the excellent system under which large quantities of material are handled, it would be impracticable, even at very low rates of production, to supply iron to points now reached. Similarly, the low cost of mining, handling and transporting iron ores has permitted other districts to attain their present position. The four districts named have each abundant productive capacity, and they have an apparently satisfactory outlook for the future in supplies of all raw material necessary. While the development of the country tributary to these centers, or within reach of them, will determine very largely the future growth, the important fact must be remembered that both the cost of production and the market facilities will influence iron manufacture. I need not offer figures to prove the assertion that, as a rule, the Birmingham district can at present produce pig iron at lower rates than prevail in the other districts; nor to demonstrate that its product has to cover greater average distances in being transported to present markets. However, the actual cost of producing pig iron is not as far apart in the districts named as is often supposed, and I am indebted to the courtesy of members of the institute for some confidential figures from which I am permitted to draw conclusions, but regret that for obvious reasons I must refrain from presenting figures, locating furnaces or giving credit to those who, by their energy and ability, are able to accomplish the remarkable results as to output and economy of operation.

COSTS IN DIFFERENT SECTIONS.

Taking blast furnaces in the various districts of nearly similar dimensions which are well located, managed and equipped, the relative costs of the different items show that the expense for fuel per ton of pig iron made was lowest in Pittsburgh and highest in Chicago; whereas, the cost of iron ore per ton of pig iron made was lowest in Alabama and highest in Pittsburgh. Labor per ton of product, however, is reported highest in the Birmingham district and lowest in the Pittsburgh and Chicago districts. This last item is affected by a number of influences, among which is the difficulty of comparing the labor accounts of different furnace plants, where, owing to methods of management, the labor account may or may not include the services of certain mechanics or officers, or the unloading of raw materials. The large amount of materials necessary for the production of a ton of pig iron in the Birmingham district as compared with the requirements of the Chicago or Pittsburgh districts augments the number of furnace employees, and the demand for labor at iron works in the former has naturally kept the per diem close to that paid elsewhere.

The Hon. Carroll D. Wright, Commissioner of Labor, has collected figures show-

Elements of cost.	Northern district.		Southern district.	
	Cost of 544,377 tons.	Cost of 1 ton.	Cost of 647,728 tons.	Cost of 1 ton.
Ore, cinder, scrap, &c.....	\$4,101,001	\$7.534	\$2,255,841	\$3.490
Limestone.....	273,207	.502	304,142	.470
Coke and coal....	2,012,754	3.698	2,890,476	4.462
Total materials	\$6,387,022	\$11.734	\$5,450,459	\$8.414
Labor.....	802,283	1.474	987,111	1.524
Officials and clerks....	100,000	.184	105,962	.164
Supplies and repairs.....	277,413	.510	397,550	.614
Taxes.....	19,615	.036	25,372	.039
Total.....	\$7,567,540	\$13.938	\$6,966,454	\$10.755

ing the cost of furnace pig iron in 26 establishments in the Northern district of the United States, and 24 establishments in the Southern district, the periods covered being irregular in the years 1888, 1889 and 1890, and from his report the foregoing summary has been excerpted.

A considerable portion of the pig iron made in the Northern section is of Bessemer grade, and as this costs, according to the same authority, \$1.43 per ton more than the ordinary run of the furnace, the cost of the average run of the furnace was correspondingly increased. In the Southern district no Bessemer pig was manufactured in the years under consideration.

FACTORS IN LOWERING COST.

The natural tendency with pig iron manufacture has been to cheapen the product. To secure this decline all branches of industries associated with pig iron production have taken part, advanced mining methods and equipment have assisted to reduce the cost as well as the losses in winning iron ore, coal or limestone from the mines or quarries, improved railway construction, stronger locomotives, cars carrying heavier loads, as well as larger vessels and more economical machinery to drive them, have done their part to bring the raw material to the furnaces and carry the product away from them.

At the plants themselves technical knowledge has joined hands with mechanical skill in the construction as well as in the operations of the furnaces.

A necessity of economical and successful steel manufacture, especially in the acid Bessemer process, appears to be the production of large quantities. This permits of utilizing labor-saving appliances, reducing fuel consumption to a minimum, and encourages the concentration of a number of blast furnaces aggregating large capacity in the vicinity of steel works, where the direct method of conveying the molten metal from the blast furnaces to the converter assists in adding to the economy of the plant. As a consequence an immense producing capacity has grown up about the steel plants of the country and these great industries have advantages in buying raw materials in quantities, in employing the highest skill and in making use of the most approved appliances.

The steel works by these pretentious blast-furnace plants can control their own supply of pig metal, produced generally at less cost than if purchased, and the questions are suggested, Are not the same economies possible for plants producing pig iron for foundries or mills in great quantities? And will not the future construction be in the direction of securing large outputs from centers of manufacture where supplies of ore and fuel can be assembled, and from which the product can be marketed most advantageously? The knowledge and skill which make blast furnace operations successful command compensation which is not measured by the tonnage produced; the division of fixed charges by a larger output, the purchasing and handling of materials and supplies in quantity, and the disposition of the pig iron and cinder, all combine to give plants of increased capacity an advantage over smaller ventures.

POPULATION AND IRON PRODUCTION.

The four districts which have been mentioned were selected as typical, and the attention has been confined to these four, although other sections of the country appear to offer equal and sometimes superior advantages to those under consideration. As we increase in population, as our industries are advanced, and as our natural resources become known and appreciated, new industrial centers will be opened, or some of those already established will increase in importance. Mr.

Hewitt, in his presidential address to the institute, New York meeting, October, 1890, gives a table showing the comparative increase in population and pig iron production in the United States for six decades, which he says (I quote from his paper) "brings out the striking conclusion that the production of pig iron has always increased more rapidly than the population, and that the ratio is an increasing one. Between 1830 and 1860 the production of iron increased twice as fast as the population. Between 1860 and 1890 it increased four times as rapidly—in reality over four times—thus proving that the national wealth continues to grow from decade to decade at a rate of acceleration of which the world affords no previous example. Inasmuch as during all this time we have imported iron in addition to our production, it follows that the consumption *per capita* has also increased more rapidly than population. In 1855, according to careful calculations which I made at that time, we were consuming iron at the rate of 117 pounds per head, whereas in 1890 the consumption has increased to rather more than 300 pounds per head, the whole of which, for the first time in our history, we are producing within our borders."

It is not practicable to make a reliable comparison, based on census figures, which will cover exactly the population and production of the four districts which have been considered in this address, but it is possible to illustrate the relation which pig iron production has borne to the population of the United States and different sections of the country in the last four censuses which were taken, and for this purpose I copy a table which I prepared for a lecture delivered before the Franklin Institute in 1891, in which the Southern States are considered as all those south of the Potomac and Ohio rivers and east of the Mississippi, including Maryland and Louisiana. The New England States are the five political divisions generally credited to that section, and the Middle States only include New York, Pennsylvania, New Jersey and Delaware, all the rest of the country being embraced under the term of Western States. The figures of the United States are also given, and as the lecture was delivered before a local institute, those of Pennsylvania were also included in the table on next page.

The figures, in whole numbers and decimals, which occur in the columns of population and production of pig iron represent the percentage which the number of inhabitants, or the output of pig iron, in that section bears to the total for the United States; although Pennsylvania is given separately, its figures are also included in those for the Middle States. This table shows among other interesting features that the *per capita* output of pig iron in the United States is now considerable less than that of Pennsylvania 30 years ago.

In three decades the output of pig iron *per capita* in Pennsylvania has quadrupled, and that of the rest of the United States, in the same time, has not quite kept pace with the Keystone State, although the Western States show a somewhat accelerated growth per inhabitant, and the Southern States a remarkable increase in this particular. Taking the production of pig iron in the United States in the future at 1 ton for each six inhabitants—say 375 pounds *per capita* annually—the Western States must double their output of pig iron and the Southern States increase their production 50 per cent. before they supply the requirements of their present population, if that population represents average consumers.

It has been my endeavor to present some of the influences which have and which will in the future affect the manufacture of pig iron, making no comparisons unjust to one district or to the interest of another,

been arrived at, and the gentlemen who represented both the manufacturers and the Amalgamated Association are to be congratulated on the spirit of concession shown by them at every conference that was held between the Amalgamated Association and the committee representing the Association of Iron and Steel Sheet Manufacturers.

THE MINING ENGINEERS.

From Tuesday until Saturday of last week the American Institute of Mining Engineers held the summer session on Lake Champlain. The meeting really began on Tuesday morning at the southern end of Lake George, where many of the members collected and made a delightful and profitable excursion together by steamer to the head of Lake George and from Fort Ticonderoga, again by steamer, up Lake Champlain to the headquarters at Bluff Point, where the Hotel Champlain had been opened in advance for the meeting.

Among those present were: Frank S. Witherbee of Witherbee, Sherman & Co. of Port Henry; A. C. Inman of the Chateaugay Iron Company; James Hall, State Geologist of New York; Dr. F. J. H. Merrill, Curator of the Museum of Natural History, Albany, N. Y.; Prof. T. Swineford Smith of the New York State Geological Survey, Buffalo, N. Y.; Prof. John C. Smock, State Geologist of New Jersey, Trenton, N. J.; M. C. W. Langdon, superintendent of the furnaces at Port Henry, N. Y.; John Birkinbine, Philadelphia, president of the institute; Dr. R. W. Raymond, Brooklyn, N. Y., secretary; Theodore D. Rand, Philadelphia, treasurer; Dr. Thomas M. Drown, professor of chemistry, Massachusetts Institute of Technology, Boston, Mass.; E. V. d'Inwilliers, Philadelphia; Justice Cox, Jr., Philadelphia, Pa.; W. G. Neilson, Philadelphia, Pa.; William Morris, president of the Pottstown Iron Company, Pottstown, Pa.; Oliver Williams of the Catsauqua Mfg. Company, Catsauqua, Pa.; Dr. Charles P. Dudley, chemist of the Pennsylvania Railroad Company, Altoona, Pa.; William L. Shearer and Arthur W. Shearer, of Pottsville, Pa.; John Thomas, Thomas Iron Company, Catsauqua, Pa.; B. F. Fackenthal, manager of the Durham Foundry, Riegelsville, Pa.; Wm. Thaw, Jr., Pittsburgh, Pa.; W. S. Scaife, Pittsburgh, Pa.; Prof. S. F. Emmons and Dr. D. T. Day, U. S. Geological Survey, Washington, D. C.; Dr. B. E. Fernow, Chief of the Division of Forestry, U. S. Department of Agriculture; E. Gybbon Spilsbury, Trenton Iron Company, Trenton, N. J.; John A. Walker, manager of the Joseph Dixon Crucible Company, Jersey City, N. J.; J. F. Holloway of Henry R. Worthington, New York; Axel Sahlin, New York; William Kent, New York; W. H. Hoffman, Brewster, N. Y.; J. M. Shervard of the Troy Steel and Iron Company, Wm. P. Mason, H. S. McCleod and Charles McCreary of Troy; W. S. De Camp, Lyons Falls, N. Y.; C. G. Buchanan, New York; George H. Hewitt, Aspen, Col.; F. L. Clerc, Joplin, Mo.; Edward H. Sanborn, editor of the *Manufacturers' Record*, Baltimore; W. H. Case, Bertha, Va.; J. E. Johnson, Longdale, Va.; P. N. Moore, G. L. Foote, St. Louis, Mo.; Per Larsen, Norway, Mich.; Prof. F. F. Sharpless, Houghton, Mich.; and W. E. Hopper, manager of the graphite mines of Fort Ticonderoga, and a large number of ladies.

TUESDAY EVENING.

President Birkinbine called the Institute to order at the Hotel Champlain, and introduced Frank S. Witherbee, who as

chairman of the local committee gave the institute a hearty welcome. He referred to the historical interests of the region, Fort Ticonderoga, Burlington, Plattsburg and Fort Frederic, and then noted the changes in the technical interests in the Champlain region since the institute met here 14 years ago. Since then more iron ore (8,000,000 tons) has been mined than in all previous history, and more ore is concentrated at the Chateaugay Mine than in any other mine in the land. The Catalan forges have given way to blast furnaces, and mines are equipped with air compressor drills and electric lights, and magnetic separation is now working out the problem of saving the leaner magnetic ores.

After a pleasant response to this welcome by Dr. Raymond, the business of the meeting began with President Birkinbine's address, from which we take the following:

The President's Address.

EASTERN PENNSYLVANIA.

In the eastern district of Pennsylvania the lean brown hematite mines, while not exhausted, now contribute but a comparatively small part of the total ore consumption. The expense of exploitation in the mines of New Jersey and of southern New York, the necessity of roasting many of these ores, does not indicate a cheap supply from this source, unless it be obtained in part by magnetic concentration. Although the Cornwall ore shows the heavy demands made upon the deposit in later years, there is evidently ore enough for the near future, and the probabilities are that discoveries may increase the quantity when such ore is required, but the comparative leanness of this ore and the necessity of roasting it work to its disadvantage.

Abundant supplies of magnetic ores can still be obtained from New York State, supplemented by some excellent red hematite. The Lake Champlain district, which has up to the present contributed a total of about 16,500,000 gross tons, and southern New York will still supply ores for eastern Pennsylvania, and the recent developments on the western flank of the Adirondack Mountains encourage the belief in additional ore reserves being obtainable through the medium of concentrating machinery. There would, therefore, seem to be some reason for anticipating a marked decline in the output of eastern Pennsylvania, and on the other hand, there seems less reason to anticipate a greater increase in that locality than in eastern New York. Improved railroad facilities should give opportunity for assembling in the vicinity of the Hudson River New York ores to be smelted by northern Pennsylvania coal, producing pig iron close to a good market.

The importations of foreign ores, which in 1892 amounted to 912,864 gross tons, and in the past five years have reached a total of 4,895,038 gross tons, have a marked influence upon eastern Pennsylvania furnaces, and this influence will continue to affect the iron industry of that district, as well as that of New York, New Jersey, Maryland and other Atlantic States.

PITTSBURGH AND CHICAGO.

The source from which the Pittsburgh district and the Chicago district draw their ore supplies, the Lake Superior region, has been contributing iron ores since 1856, and doing this on a liberal scale since 1867, a total of 50,000,000 gross tons having been taken from the mines of the four ranges included in that region—the maximum amount shipped having reached 9,000,000 gross tons in 1890. The number of important producers which continue to contribute iron ore liberally for a term of years, the knowledge of new discoveries each year adding to the ore reserves, and

the millions of capital vested in the Lake Superior region in mines, railroads and in shipping docks, supplemented by other millions in vessels and receiving docks, would indicate that the supply from this source does not promise an early exhaustion. The Connellsville and other Pennsylvania coal fields relied upon by the Pittsburgh and Chicago districts for coke also give little anxiety as to its future supply.

BIRMINGHAM.

Neither does there seem any immediate prospect of either the coal or the ores in the vicinity of Birmingham becoming exhausted, but the large increase in the number of furnaces will rapidly deplete the easily won leaner ores, of which the greater quantities must be mined to produce a ton of pig iron than where, as a rule, the veins or beds are richer, as is the case in the Lake Superior region, and although the Alabama ore supply is great, the heavy drafts upon it may add so much to the cost of mining as to seriously detract from other local advantages. It is probably practicable to augment the local ore supply of the Alabama section in quantity and improve the average yield of the ore by using known deposits of iron ores in Cuba.

While neither of the four districts now producing pig iron largely gives promise of early restriction of output, the blast furnaces in eastern Pennsylvania to day largely depend upon New York, New Jersey, Lake Superior and foreign ores to enrich their depleted local mixtures. The Pittsburgh district must continue to bring ores long distances, the Chicago district will have to convey both fuel and ore hundreds of miles, and the Birmingham district with coal and ore convenient will have to mine and consume a greater quantity of each to produce a ton of metal than either of the other districts named.

It would seem that, as even with the best of ores used 1½ tons are required to make 1 ton of pig iron, while the consumption of coke is often less than 1 ton, it would be better to manufacture pig iron at Lake ports and be cheaper to transport less than 1 ton of coke than to haul 1½ tons of ore, but it is here that the local market for the pig iron of the Pittsburgh district is such an important factor. Similarly it would seem economy to assemble the raw materials where the haul of coke would cover less distance than from the Connellsville region to Chicago, but the same commercial reason holds true there.

The rapid development of the western portion of our country, particularly that which is tributary to or can be easily reached from the Great Lakes, may divert from Chicago and vicinity part of the future iron production to points nearer the ore fields, and yet within convenient reach of cheap transportation for the fuel. Whether this fuel will be transported in its raw state and coked at the blast furnaces, or whether it will be conveyed as coke, is a problem in process of solution, but I confess to feeling a gratification that the enterprise which I had the privilege of suggesting five years ago—viz., the erection of a blast furnace at Duluth, Minn., in which Minnesota ores are smelted by the use of coke made near at hand from Pennsylvania coal carried by vessel to the head of Lake Michigan—has been sufficiently successful to encourage other Lake ports to seriously consider the advisability of carrying out a similar project.

LOCAL AND DISTANT MARKETS.

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COSTS IN DIFFERENT SECTIONS.

Taking blast furnaces in the various districts of nearly similar dimensions which are well located, managed and equipped, the relative costs of the different items show that the expense for fuel per ton of pig iron made was lowest in Pittsburgh and highest in Chicago; whereas, the cost of iron ore per ton of pig iron made was lowest in Alabama and highest in Pittsburgh. Labor per ton of product, however, is reported highest in the Birmingham district and lowest in the Pittsburgh and Chicago districts. This last item is affected by a number of influences, among which is the difficulty of comparing the labor accounts of different furnace plants, where, owing to methods of management, the labor account may or may not include the services of certain mechanics or officers, or the unloading of raw materials. The large amount of materials necessary for the production of a ton of pig iron in the Birmingham district as compared with the requirements of the Chicago or Pittsburgh districts augments the number of furnace employees, and the demand for labor at iron works in the former has naturally kept the per diem close to that paid elsewhere.

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The natural tendency with pig iron manufacture has been to cheapen the product. To secure this decline all branches of industries associated with pig iron production have taken part, advanced mining methods and equipment have assisted to reduce the cost as well as the losses in winning iron ore, coal or limestone from the mines or quarries, improved railway construction, stronger locomotives, cars carrying heavier loads, as well as larger vessels and more economical machinery to drive them, have done their part to bring the raw material to the furnaces and carry the product away from them.

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POPULATION AND IRON PRODUCTION.

The four districts which have been mentioned were selected as typical, and the attention has been confined to these four, although other sections of the country appear to offer equal and sometimes superior advantages to those under consideration. As we increase in population, as our industries are advanced, and as our natural resources become known and appreciated, new industrial centers will be opened, or some of those already established will increase in importance. Mr.

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The figures, in whole numbers and decimals, which occur in the columns of population and production of pig iron represent the percentage which the number of inhabitants, or the output of pig iron, in that section bears to the total for the United States; although Pennsylvania is given separately, its figures are also included in those for the Middle States. This table shows among other interesting features that the *per capita* output of pig iron in the United States is now considerable less than that of Pennsylvania 30 years ago.

In three decades the output of pig iron *per capita* in Pennsylvania has quadrupled, and that of the rest of the United States, in the same time, has not quite kept pace with the Keystone State, although the Western States show a somewhat accelerated growth per inhabitant, and the Southern States a remarkable increase in this particular. Taking the production of pig iron in the United States in the future at 1 ton for each six inhabitants—say 375 pounds *per capita* annually—the Western States must double their output of pig iron and the Southern States increase their production 50 per cent. before they supply the requirements of their present population, if that population represents average consumers.

It has been my endeavor to present some of the influences which have and which will in the future affect the manufacture of pig iron, making no comparisons unjust to one district or to the interest of another,

and to show how these influences have changed at various dates. Other changes may be looked for, and each locality now producing iron, or where it is desired to produce it, must consider the bearing which the ore and fuel supplies, the growth of population and the market offered by other localities, possibly far removed, will exert as competitors. Under good management the maximum difference between the costs of similar grades of pig iron, as reported by members of the institute, is about \$3 in the four districts specially considered in this paper, but the cheapening of transportation brings plants into close competition which are hundreds of miles apart.

The indications are that successful iron industries built in the future will follow the tide of population rather than that they will form nuclei in out-of-the-way places for communities to emigrate to, and that, while the manufacture of steel will continue to advance, there will be large demands for iron made from ores which are not within the Bessemer limit.

loaded cars. The visitors next studied the central hoisting plant, where 16 drums are arranged to hoist by friction clutch connection with the same central shaft. The party divided and visited several of the pits of the New Bed, and also the Ball & Norton and Wenstrom magnetic separators, which together produce 350 to 400 tons of concentrates daily.

At the evening session the principal paper was by Dr. Chas. B. Dudley on

How to Prepare Specifications for Structural Materials.

Following the same lines as in previous papers on general plans for preparing specifications, the author gave much valuable and practical advice for the preparation of specifications for structural materials.

Aside from the perhaps common but irrelevant use of specifications either to embarrass manufacturers or to display expert knowledge of the materials under consideration, or as a means of avoiding competition by the addition of local conditions

was made on steel rails ten years ago by the Pennsylvania Railroad Company. Nearly 100 rails which had given service, good and bad, were carefully analyzed and tested, and attempts made to specify from the results. No one can question the philosophy of this. Another test was made recently of about 30 worn out fire boxes of known life and mileage. Some of them had given good and others bad service. They were tested physically and chemically, and the results were made the basis of new specifications for fire-box steel. Unfortunately, however, it is not safe, in view of the experience thus gained, to rely wholly upon such a series of tests for several reasons. 1. It is hardly ever possible to get a series of tests which does not contain contradictory results. 2. It is almost impossible to get good and bad materials which have been subjected to comparable conditions. The good service of the good sample is too frequently due to some specially favoring conditions and not inherent good qualities of the material. Again, the samples are always

Distribution of Population and Production of Pig Iron According to Census Returns of 1860, 1870, 1880 and 1890.

	1860.			1870.			1880.			1890.		
	Population.	Production of pig iron.	Inhabitants per ton of pig iron.	Population.	Production of pig iron.	Inhabitants per ton of pig iron.	Population.	Production of pig iron.	Inhabitants per ton of pig iron.	Population.	Production of pig iron.	Inhabitants per ton of pig iron.
New England States.....	3,135,283	24,600	117.87	3,487,924	30,778	113.33	4,010,529	27,640	145.10	4,700,745	30,162	155.85
Percentage.....	9.97	2.69		9.05	1.68		8.0	0.82		7.51	0.35	
Middle States.....	7,571,201	7,6369	10.72	8,935,821	1,171,115	7.63	10,643,486	2,143,833	4.96	12,869,295	4,657,670	2.76
Percentage.....	24.08	71.53		23.17	63.9		21.22	63.50		20.55	54.45	
Southern States.....	9,981,486	100,761	89.06	10,859,955	164,768	65.91	13,975,686	311,639	44.95	16,236,784	1,582,106	10.62
Percentage.....	31.74	10.20		26.16	8.99		27.86	9.23		25.93	18.50	
Western States.....	10,755,357	153,825	69.92	15,274,671	466,215	32.76	21,526,032	862,799	24.11	28,815,428	2,283,436	12.62
Percentage.....	34.21	15.58		39.62	25.44		42.92	26.45		46.01	26.70	
United States.....	31,443,321	987,559	31.84	38,558,371	1,832,876	21.04	50,155,733	3,375,911	14.86	62,622,250	8,553,374	7.32
Pennsylvania.....	2,906,215	580,049	5.01	3,521,951	922,564	3.82	4,282,891	1,723,492	2.48	5,258,014	4,207,599	1.25
Percentage.....	9.24	58.74		9.13	50.33		8.54	51.06		8.40	49.19	

The secretary, Dr Raymond, then read an obituary notice of the late Dr. T. Sterry Hunt, written by his former associate, James Douglas. He also read a similar memorial prepared by Jos. D. Weeks on Wm. P. Shinn of Pittsburgh.

Prof. James Hall, State Geologist of New York, by invitation of the president then exhibited the geological map of the State of New York, made in 1843, and announced the plans for publishing such a revision of the map as is now possible under the recent act of the State Legislature, by which the topographical basis will be provided by co operation with the United States Geological Survey. On this the known geology will be printed, leaving blank areas where the information is too meager.

WEDNESDAY.

The excursion features began under most favorable weather conditions with a trip over the Delaware & Hudson Canal Company's road to Port Henry. Here connection was made with the Lake Champlain steamer to old Fort Frederic, where lunch was served. Mineville was next reached by the switchback railway and here the afternoon was spent examining the various openings of Witherbee, Sherman & Co. and the Port Henry Company. The Bleichert system of rope haulage was first inspected where it carries the ore to the cars from the Lover's Hole opening. It is operated by a stationary steel rope track on which ore buckets travel, propelled by a small wire rope, to which the buckets are attached by a cam clutch. The system operates practically by gravity, the empties being pulled up by the descent of the

favorable only to some individual, the author considers the objects of a specification as defined thus:

1. A specification is an effort on the part of the consumer to tell the producer what he wants.

2. A specification is of the nature of a contract binding both the consumer and the producer to its provisions, and being equally binding upon both.

These two general views involve: 1, knowledge on the part of the specification maker of what he wants, and, 2, an agreement after careful consultation with the producer who is to furnish the materials, as to the limitations, methods of test, methods of delivery, &c.

The sources of information in preparing desirable specifications may be considered under six heads:

1. Study of good and of bad materials which have been in service.

2. Direct experiments for a limited time on materials in actual service.

3. Consultation with those who must use the material in service.

4. Examination of materials which have failed in service.

5. Examination and test of materials from different manufacturers.

6. Visits to and study at works where the materials are made.

Study of Materials Which Have Been in Service.—It is quite obvious that if the behavior can be determined of materials which have been in service, some of which have given good service and some of them bad service, and if these materials differ very much, a clue is furnished which will throw much light on what kind of materials should be aimed at in specifications. Perhaps the most noted study of this kind

open to doubt on account of the inefficiency of the records. It is always a question whether the sample has given the long life claimed for it, and whether there have not been changes in the personnel of those in charge of the material in service.

These and other limitations lead the author always to distrust or to use with a grain of allowance what seem to be the teachings of the tests of the materials which have been in service, and he would hate to base a specification on such questioning of the service unless the information is so clear as to admit of less question than is usually the case.

Direct Experiments on Materials in Use.

—In view of the difficulty of getting a satisfactory number of samples out of service, which have been made under sufficiently nearly uniform conditions, it is often possible to get more satisfactory data at less time and expense by making positive experiments under controllable conditions. Lately this method is coming more and more into use. The material is of such a nature that a positive comparative test of two or three different qualities of materials can be made under the same conditions and results obtained in six months or a year. An illustration of this method may be drawn from the experimental work on bearing metals. The problem is, What composition or alloy is it best to use as a bearing metal? To decide this a comparative test of different alloys is made on opposite ends of the same axles, and under the same conditions as nearly as they can be controlled. Such tests can be made within six months and very satisfactory indications obtained as to what quality or composition of metal gives the best results.

It is surprising, on the other hand, that sometimes such results must be distrusted. Contradictory results are frequently obtained even from such positive experiments, chiefly because of the difficulty of controlling the conditions.

Consultation With Those Expert in Using Materials.—More valuable information is often obtained from those who are constantly watching the wear of structural material, as in a bridge, than from the engineer's occasional inspection, particularly if the evidence is gathered from a considerable number of constant observers.

Information from Failures.—Of course it is always a question whether the fault of any part is a question of design or of material, or of abuse during construction; so that the examination of materials which have failed in service will not always make it clear that the material is to be blamed. A very interesting illustration of how difficult it is to comprehend all the conditions of such an investigation, and also how the study of materials which have broken in the service may not locate the difficulty where it is supposed to be, may be seen from the experience of the Pennsylvania Railroad Company with locomotive spring steel. By investigation of a large number of broken leaves of springs, no difference, chemical or physical, from successful springs could be assigned as the cause of breakage. The designs agreed with the best formulas in this country and elsewhere, bad shop practice, therefore, seemed most probable. But the breakage could not be traced to one shop or one locality. It finally appeared that the trouble rested with the fact that the mechanical engineers had selected a compromise between the strong springs suitable for the rough portions of the road, and soft springs which did well on smooth roads but gave way where the track was very rough.

Examination of Materials on the Market.—It is, of course, absolutely necessary to know what the manufacturers can make and make successfully. This may be obtained by having samples furnished of which tests are made by the consumer, or by obtaining the results of tests made by the manufacturer himself at his works. Without this impossibilities may be demanded. In this case likewise considerable precaution is necessary. Samples from the manufacturers will generally be deceptive simply because they naturally put the best foot forward and send a little better material than they can regularly turn out. In the recent report of the Chief Engineer of the United States Navy, the complaint was made that the manufacturers promised a great deal more than they could actually fill and sent samples that were much better than they could furnish in the finished product, especially in the matter of steel castings. Here the manufacturers were evidently to blame for the resulting harassing specifications.

There is still one more source of information which must not be overlooked, and that is visiting the works where materials are made and inspecting the processes. Much valuable information can be obtained from this source. The man who is to draw the specifications is often saved very serious blunders by knowing what the mills can turn out, and this source of information is so obvious that it need not be dwelled on. Moreover, a knowledge of the process is almost absolutely necessary in drawing a specification wisely.

The specification as a contract.—The objects to be considered under this heading are methods of selecting samples; methods of testing many times in what quantities and how the material will be bought, and finally the limitations as to characteristics of the materials which will cause rejection or non-acceptance by the consumer. It seems desirable to give a pattern of the desired material. This is always better

than it is hoped to get, and is regarded as a stimulus to the manufacturer. Many times parties aim to make an article just filling the specifications—that is, the pattern is their limit. This is always a mistake. No commercial process is sufficiently under control to give exactly what is aimed at. Following this the method of sampling is stated, also any regulations as to deliveries and the quantities in a single shipment, time of delivery, and information of this kind. Three things should be insisted upon in the selection of a sample: 1. It must always be selected by a representative of the purchaser and in no case by the manufacturer or his representative. 2. In many cases the sample should be taken after the material arrives at its destination. 3. In no case does the author attempt to take an average sample, one specimen selected at random represents the material. The material ought all to be as good as the requirements of the specification, and if so it is immaterial where it comes from. Furthermore, the use of average samples allows a little good material to carry a considerable amount, many times, of inferior material. The experience of having a single sample represent a shipment has been very satisfactory and complete. Of course in the case of large structural materials, such as bridges, beams, &c., the sampling may wisely be made wider than this; but the author's view is that the interests of both manufacturer and consumer will be best subserved by not trying average samples. A knowledge of the materials may be gained by making as many tests as desired—that is, by making one test represent as small a part of the total as may be agreed upon between the two parties, but let each sample for a test accept or condemn a certain lot.

Limitations.—The question of limitations is perhaps the most important of all. In many specifications they are, beyond doubt, too narrow. There is often a difference of only 5000 pounds between the upper and lower limits of the tensile strength of steel, and when it is reflected that the temperature at which the material passes the rolls at the last pass may readily change the figures in steel to almost this extent, it seems very singular that so narrow a limit should be required. The factor of safety is far wider than this. In most bridge construction it is six, in boiler construction five and in many other cases as high as ten—that is to say, the material is to be put in service where the calculated strains are only one sixth or one fifth or one-tenth of the ultimate strength of the metal. As evidence of how the narrow limits often defeat themselves, a manufacturer lately stated that he was frequently able to come just within the specifications by the following plan: A piece is tested from the web of an I-beam, and fails. He then tests a second sample from another place, and this fails. By the knowledge gained by these two tests he is able to judge as to whether a slow pull or a fast pull will give the better results. He accordingly pulls a third piece, fast or slow, and succeeds in filling specifications which contain nothing against this method of testing.

The author also insists on the final precaution of a careful consultation between the two parties before the work of drawing the specification is completed.

The subject of iron-ore concentration occupied the remainder of the session. Axel Sahlin read a paper on "The Granulation of Iron Ore by means of Crushers and Rolls." This was followed by a paper offered by S. R. Krom of New York, on "Crushing Iron Ores for Concentration with the Sturtevant Mill," which was devoted to discussion of W. H. Hoffman's paper at previous meeting, on the results of granulation with the Sturtevant mill

at the Croton iron-ore mines. The point that the mill in question is an attrition mill, which would presuppose an excessive proportion of fines, and also some criticisms as to the horse-power consumed by this mill compared with rolls, led to discussion from Mr. Hoffman, E. C. Huxley, Henry M. Howe and Axel Sahlin, in which much detailed data concerning the efficiency of the several methods of granulating ore was contributed. In regard to the wear of various metals in crusher jaws, it became evident from the remarks of Mr. Howe and Dr. Raymond that tough rather than hard steel and even wrought-iron plates must be considered as eligible material.

This was followed by a "Note on the Use of a Mechanical Stirrer for Promoting Chemical Action in Phosphorus Determination," by Edward K. Landis, Pottstown, Pa. "Titaniferous Iron Ores in the Blast Furnace," continued discussion of the paper of H. B. C. Nitze on the magnetic ores of Ashe County, N. C., and a discussion of the paper of W. H. Morris on "The Control of Silicon in Pig Iron."

W. H. Hoffman also made a few remarks on his paper concerning the late discovery of large quantities of magnetic and non-magnetic pyrites in the Croton magnetic iron-ore mines.

THURSDAY.

The feature of the day was an excursion to Lyon Mountain, where the works of the Chateaugay Ore & Iron Company were visited under the guidance of Mr. Inman. The crushing by multiple jaw crushers and by rolls was examined and the Conkling jigs by which about 1000 tons of ore are daily worked, producing about one-third this quantity of concentrates. The tailings, carrying 20 per cent. of magnetite, have been treated experimentally by the Conkling's magnetic separator, but that work is now suspended.

A working sample of the Reed magnetic separator was also exhibited. After this the large ore body was examined and the party continued by rail into the Adirondack wilderness to Saranac Lake, and by coaches to Hotel Ampersand for dinner.

The evening was again devoted to a session, which opened with the announcement by C. M. Ball of a paper on the Cumings ore pulverizer, drawings of which were placed before the meeting for inspection. The meeting then went into a long and occasionally exciting discussion on the power required for iron-ore crushing machinery, data widely varying in their character being presented by Hoffman, Huxley, Buchanan and others. A. L. Inman reported that at the Chateaugay mill the one side using a break multiple crusher and two rolls crushed during 1890, in 312 working days, 512 tons per day of 20 hours. C. M. Ball referred to the Benson plant at Little River, where four Ball separators are being used. The works now have a daily output of 200 to 300 tons of concentrates, the maximum being 375 tons. The milling capacity is 750 tons of rock, 3 tons of which produce 1 ton of concentrates. Recently, at Croton Falls, the concentrator built by the late Wm. P. Shinn has been treating 200 tons in ten hours. An additional plant is now to be started at Rittenhouse Gap, eastern Pennsylvania. President Birkinbine reported that during the last year there were produced in the United States 250,000 tons of concentrates, about equally divided between water jigs and magnetic separators. The question by Frank S. Witherbee as to whether magnetic machines were in successful operation for cobbing ore brought out the fact that as yet no work on a large scale is being done in this direction.

Friday morning was given over to a charming excursion on Lake Champlain, the

afternoon being devoted to a final session, at which a large number of members were elected and other routine business was transacted. A number of papers were read by title. The meeting closed in the evening with a dance in the hotel parlors.

MANUFACTURING.

Iron and Steel.

The blast furnace of the Lehigh Iron Company, at Allentown, Pa., was sold on Friday, July 1, to the Second National Bank of Allentown for \$15,000. This concern made an assignment some months since, and 15 judgments, aggregating \$235,400, were filed against the furnace property, which has just been sold as stated above.

A charter for the Wheeling Steel & Iron Company of Wheeling, W. Va., which represents the consolidation of the Benwood Iron Works, Belmont Nail Company, Wheeling Iron & Nail Company and Wheeling Steel Works, has been filed. The incorporators nominally are L. E. Stifel, Geo. R. Caldwell, C. R. Hubbard, W. H. Hornbroke, Jos. Fell and Henry M. Russell, each of whom took one share for the purpose of incorporation.

The two Shoenberger furnaces, Shoenberger Speer & Co. of Pittsburgh made during the first six months of 1892, 50,894 tons of No. 1 Bessemer iron.

Last week Deputy Clerk E. L. Doak of the United States Circuit Court at Nashville, Tenn., sold at public auction the property of the Rockdale Mining Company, to satisfy a decree rendered in favor of McLanahan & Stone, Hollidaysburg, Pa. The property was sold to J. Simpson Africa at \$18,000.

The Embreeville, Tenn., iron furnace was compelled to shut down a few days last week on account of stock giving out. The bad weather has greatly interfered with the getting out of ore, &c. The furnace is now making from 150 to 200 tons of iron per day.

The employees of the Lookout Rolling Mill at Harriman, Tenn., have made a demand for a better scale of wages on perhaps 200 items of iron work. The employees are members of the Amalgamated Association of Iron Workers, and unless their demand is complied with state they will walk out.

Belfont Furnace at Ironton, Ohio, blew out on the 1st inst. for repairs. Operations will be resumed about September 1.

Norton Furnace at Ashland, Ky., was banked June 8.

Sligo Furnace, situated at Sligo, Dent County, Mo., sustained considerable damage by the recent tornado. The coal house, casting house and small outbuildings were demolished, and the smokestacks all torn down. The stack was shoved out on the 25th of last month, and it is expected to go in blast again before the middle of the present month.

The second stack of the Crown Point Iron Company, at Crown Point, N. Y., blew out June 13 for repairs, and both furnaces are now idle.

Gadsden Furnace (charcoal), at Gadsden, Ala., has signified its intention to shut down within 30 days.

Tropic Furnace, at Jackson, Ohio, has blown out for repairs after a successful run.

The second Spiegel furnace of the New Jersey Zinc & Iron Company, at Newark, N. J., blew in June 8, after a two months' rest, and both stacks are now running.

One of the furnaces of the Lackawanna Iron & Steel Company, at Scranton, Pa., blew out June 23 for alterations and repairs, leaving four furnaces at work at this plant.

No. 3 blast furnace of the Pennsylvania Steel Company, at Steelton, Pa., blew in June 30, and is now working very satisfactorily. All four furnaces of the company are now in operation.

Machinery.

The Rider Engine Company of 37 Dey street, New York, have been engaged in the manufacture of hot air engines for about 23 years. They have added to their line of manufacture the improved Ericsson pumping engine. Increase in their business has made necessary the addition to their plant of a building 80 x 45 feet, two stories high, also a new boiler and engine house, in which will be placed a new Corliss engine, their former facilities having been found entirely inadequate to meet the demand.

The Pittsburgh office of the Stirling Boiler Company of Barberton, Ohio, in charge of J. H. Harrison & Co., recently closed a contract with the Bradcock Wire Company of Pittsburgh for a 500 horse-power boiler of the Stir-

ling type, and with the West Superior Iron and Steel Company of West Superior, Wis., for 450 horse power.

There is now a good prospect for the Chattanooga, Tenn., Tool Company resuming operations. Under the reorganization the following directors have been elected: T. G. Montague, C. P. Richardson, Wm. W. Gordon, H. S. Chamberlain, I. Noa, Geo. A. Williams and C. S. McKune. The new company have ample capital, and it is believed the plant will soon be put in full operation.

It is stated that the Sweet Straight-Line Engine Company of Syracuse, N. Y., finding the demand for the Sweet Straight-Line Engine greater than their present facilities for manufacturing it, are looking about with a view to establishing branch works at some other point. In this connection Hartford, Conn., has been favorably mentioned.

Extensive enlargements are being made to the shops of the Janesville Machine Company, at Janesville, Wis. The capacity of the foundry has been doubled, and several smaller buildings have been built.

The Central Railroad of New Jersey is erecting a machine shop, 100 x 75 feet, in Jersey City.

H. J. Anthony's machine shop, at Gloversville, N. Y., has been destroyed by fire.

The Springfield Emery Wheel Mfg. Company was put into insolvency by its creditors on May 16, and James Staples of Bridgeport was appointed as trustee. A new company has been formed, adding new capital and new machinery, which purchased from the trustee the plant, machinery, stock and all appliances. A number of improved machines for the manufacture of emery wheels and emery machinery will be added. The new company also has all the records of the shipments of the old company and can supply parts or duplicate orders given to the old company any time during the last eight years. They have retained the principal foreman, superintendent and general manager. The new company will be known as the Springfield Emery Wheel Company, taking the old company's name with the exception of the word "Manufacturing," which is dropped out.

The Skinner Chuck Company of New Britain, Conn., have secured patents on a new variety of chucks, and as soon as the new machines ordered are received will open another department for the manufacture of the new tools.

The Buffalo Foundry Supply Company are about to erect at Buffalo, N. Y., their plant, which will be called the Columbian Facing Mills, having purchased a tract of land in a suitable locality, on a railroad in the railroad center of Buffalo. Those at the head of this enterprise have been manufacturing foundry facings for over a quarter of a century, and propose to build and equip the most complete plant for the manufacture of this class of goods in the world. The company's officers are: J. A. Heinsheimer, president; L. W. Heinsheimer, secretary and treasurer; J. S. Kingsland, general manager.

Hardware.

The Patten & Countryman Mfg. Company, DeKalb, Ill., have recently changed their name to that of the Patten Mfg. Company. The capital stock of the company was also increased from \$5000 to \$25,000. The officers of the company are as follows: S. W. Patten, president; Frank C. Patten, secretary and treasurer; and Thomas L. Halloran, superintendent. These parties, with Samuel P. Bradshaw and Don F. Williams, comprise the Board of Directors. The company report business as quite satisfactory.

The Buffalo Scale Company, Buffalo, N. Y., have recently taken possession of their large new factory, which has a frontage of 615 feet on Scott, Illinois and Mississippi streets, three stories in height. Its location is most advantageous for receiving raw material, and equally convenient for shipping their products. The freight depots of the several railroads are in close proximity, as also are the docks of all the steamboat lines. The plant is provided with all modern machinery and appliances for rapidly converting raw material into scales. The general offices are on the ground floor, and are fitted up in a rich and substantial manner.

Peabody & Parks, Troy, N. Y., manufacturers of specialties, on July 1 took possession of their new factory, which has been recently completed. They advise us that in the new plant their facilities for the production of goods have been greatly improved, the capacity having been also largely increased.

Miscellaneous.

The large chain works at Riverton, Pa., which started for the first time in April last, have been entirely destroyed by fire.

The Mansfield Coal & Coke Company of Pittsburgh, Pa., have declared a dividend of 3 per cent. out of the earnings of the last six months.

Among new incorporations in this State are the United States Wire & Cable Company of Schenectady, to manufacture and sell wire, wire rope, cables, conductors of every kind for the transmission of electricity, and all wires used in connection with and for the use of electrical machinery, apparatus, and the building, installation and use of electrical plants; to make and sell machinery, and the installation and covering of wires, cables and conductors of and for electricity; capital, \$1,000,000; and directors: Benjamin E. Sunny, Chicago; Silas A. Barton, Boston; Samuel Insall, S. Dana Greene, New York; John Kreusi, Schenectady.

A letter has been received at Anniston, Ala., from President Cornfoot of the United States Car Company, successors to the United States Rolling Stock Company, stating that the various plants will be started up at once. The new company, who are composed of nearly all the creditors and bondholders of the old company, will lease the several plants from Receiver W. C. Lane, pending foreclosure proceedings, and put them in operation, thereby getting the benefit of the demand which is now being made all over the country for rolling stock. The new company have unlimited means and will be provided with ample working capital.

The Standard Underground Cable Company of Pittsburgh have declared a quarterly dividend of \$1.50 per share, payable July 15.

The Warwood Tool Company have been organized at Wheeling, W. Va., with a capital stock of \$100,000, for the purpose of manufacturing and selling coal-miners' tools and agricultural implements. The incorporators are D. L. Heiskell, F. M. Heiskell and S. J. Eccles.

A fire at the new shops of the Nashville, Chattanooga & St. Louis Railway, at Nashville, Tenn., destroyed the freight car erecting and repair shop, together with a number of cars. The loss is \$12,000, covered by insurance.

Shickle, Harrison & Howard Iron Company, St. Louis, Mo., one of the largest pipe and general foundries in the country, have decided to substitute swing cranes in the place of the travelers, and have adopted the Ridgway steam-hydraulic system of cranes, and an order for an outfit of 15-ton cranes has been placed. As this company control the recently burned St. Louis Steel Company at East St. Louis, this latter plant, which is to be at once rebuilt, will also be equipped with the Ridgway cranes.

The Lebanon Chain Works, Lebanon, Pa., which were first organized in 1891, have recently removed from their original location adjoining the East Lebanon Iron Company's works. The factory has been taken down and reerected with considerable additions on ground belonging to the Lebanon Iron Company on the line of the Lebanon Valley branch of the Philadelphia & Reading Railroad. The building as it now stands measures 165 x 40 feet and is very nearly complete. The necessary fitting and machinery are being inserted, and the works will very shortly be put in operation for the manufacture of ships' cables, crane, mining and rigging chains, steel and iron dredging chains, &c., made from their own iron. The staff of the Lebanon Chain Works has been recently reorganized with the following officers: Thomas Evans, president; H. T. Atkins, secretary; J. R. Beckley, treasurer, and Alvin Johnson, superintendent.

W. E. Smith and Mercer B. Tate of Harrisburg, Pa., have recently gone into partnership under the name of Smith & Tate Company, Limited, for the manufacture of agricultural implements, wagons, &c., and general jobbing work. Their energies will be particularly devoted to the production of W. E. Smith's ratchet and lever spring tooth harrows, on which patents have been secured. A building 50 x 100 feet is now being erected for the company at West Harrisburg, and will shortly be ready for factory use.

Among recently licensed corporations in Illinois are the following: The Barr Wheel and Foundry Company, Chicago; capital stock, \$100,000; incorporators, H. R. Walker, H. Kendall and H. A. Walker. The Aroza Mfg. Company, Chicago; mining tools; capital stock, \$25,000; incorporators, F. F. Lincks, L. C. Knudson and others. Chicago Fire Arms Company, at Chicago; capital stock, \$100,000; incorporators, Charles E. Corrigan, James G. Kirk and W. G. Cooke. Spiral Tower and Observatory Company, Chicago; capital stock, \$200,000; incorporators, David C. Burson, William C. Stevens and Lewis W. Cass.

The freight car erecting shop of the Nashville, Chattanooga & St. Louis Railroad was destroyed by fire last week. Loss about \$12,000.

TRADE REPORT.

The broken week and the uncertainties of the labor situation have restricted business in all markets. The Eastern mills and those of the Western mills which are non-union are picking up considerable business for immediate and early delivery which the idle works cannot fill. The Western mills during the past year have reached into so extensive a territory and have so largely gone into contracts for long time delivery that many sections are affected. It has caused some stiffening all along the line in Finished Iron and Steel, carrying prices closer to the nominal quotations. Manufacturers who formerly figured tenths of a cent per pound, or at most one half that, are now learning to regard an advance of 50¢ or \$1 as a very important matter. In fact, it may not be very long before prices are made by the ton instead of by the pound.

In Pig Iron the expected announcement of a reduction of \$1 per ton by the Thomas Iron Company has come to-day, thus equalizing the Eastern market, as compared with those of the West. Some of the Southern furnace companies who withheld from the market while their neighbors were crowding down prices seem now to have accepted the situation and are meeting the market, the first effect thereof appearing in Chicago. Bessemer Pig is dull in Pittsburgh.

Billets are quiet East and West. An indication of the feeling which prevails among sellers is furnished by the fact that a large Eastern mill has contracted for a year's supply to a wire mill on the basis of \$24.75, delivered.

Chicago reports some activity in Steel Rails, while in the East one mill has taken a 10,000-ton order for a Southern road and is about to close a second 10,000-ton contract. The estimate made by the *Railroad Gazette* that the new mileage this year will not exceed 3000 miles, if it reaches that figure, leaves little hope of even a moderately active year.

In Bars, Plates and Structural Material there is a firmer feeling for early delivery, but there is little doing in large contracts. An Eastern mill has captured a 5000-ton bridge contract in the West, as recorded by our Chicago dispatch.

Copper circles have been rendered somewhat uneasy by rumors of friction in the combination. Tin is quiet, while Lead is developing some strength. It looks as though the long Cœur d'Alene strike were beginning to tell on supplies. Tin Plate is quiet.

Our cable dispatch refers to a squeeze of the bears on Cleveland Iron.

Philadelphia.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Pa., July 5, 1892.

The second half of the year opens with the usual flurry and bluster in regard to the labor scale. If any reliance could be placed on reports which appear from day to day in the daily press it would be supposed that the greatest contest on record has been commenced. We venture the statement that 30 days hence the thing will be forgotten and will leave hardly a ripple to show that there has been any disturbance at all. In individual cases there may be trouble, beyond that nothing but talk. If there is business enough to warrant it a sufficient number will sign the scale to bring most of the others in, but if, on the contrary, the demand does not improve the thing will drag along until in some districts, at all events, the men will be glad to get work on best terms available. There is nothing in it to show that the contest will be more than a half-hearted affair on either side. There is no great inducement for the active employment of capital under present conditions, neither is there anything in the situation to warrant labor in expecting employment on more favorable terms than are now available. If business improves in a few weeks time it will give a new phase to matters, but in the meanwhile capital is looking back to the results of the past six months, and demands some guarantee against further depletion during the next six months. If that can be secured by a better market—well and good—but, to use a common expression, "they don't want to go it blind." On the whole, the odds are a little in favor of capital, but there is no great probability of any material change either in the labor scale, in market quotations or in consumption. The clearing up of stocks of finished material will help the market somewhat, but as the demand broadens, first one mill and then another will start up, until finally the tendency toward better prices will again be checked, unless new sources of demand are met with, in which case there will be no serious trouble in regard to the labor scale, as it will surely be the beginning of the oft promised and long looked for "turn for the better." All that can be said of the immediate outlook is that the demand for Finished Material is likely to improve and that prices are firmer. Pig Metal, on the contrary, is feverish, weak and irregular, with not much chance of immediate improvement, although there can be no doubt that if June figures are not the lowest for 1892 those of July and August most assuredly will be, and we are a little inclined to favor July as the period in which the lowest figures ever quoted will be placed on record.

Pig Iron.—The market, as usual at this season, is a little overloaded. There is a fair demand, everything considered, and there are inquiries that appear to indicate more than ordinary interest among large consumers, but no large amount of business has been closed thus far. There is an impression that at the extremely low prices now ruling purchases cannot be far astray, while if the market should turn they would be unusually advantageous. Nevertheless, a great deal of caution is shown, and for the present bids for large lots are at prices lower than any that have been accepted thus far, and it is yet to be seen whether holders will meet offers of this kind. In isolated cases it may be done, but taking the average of the market during the past two or three weeks, it is hardly likely that any quotable change will be made, except in high priced irons, which probably need readjustment in proportion to those ruling for other grades. The tendency during the past six months has been steadily downward,

the average decline being about \$2 per ton, and while one would suppose that there was no possibility of decline from \$12.50 @ \$13 for Mill Irons, \$13.50 @ \$14.25 for No. 2x, and \$14.50 @ \$15 for No. 1, it is by no means certain that such will not be the case. The general feeling, however, as well as the general outlook, seem to encourage the idea of a better market before long. Production has been cut down pretty sharply, while prospects in regard to consumption are decidedly better than for some time past. Meanwhile quotations are usually as follows, subject to the usual concessions on Southern Irons at near by markets west and south of Philadelphia, viz:

American Scotch, No. 1x.....	\$16.50	@	\$17.00
American Scotch, No. 2x.....	15.50	@	16.00
Standard Penna (Lake Ore), No. 1x.....	15.00	@	15.50
Standard Penna. (Lake Ore), No. 2x.....	14.00	@	14.50
Standard Penna. (Lake Ore), No. 2 plain.....	13.50	@	14.00
Medium Quality, No. 1x.....	14.50	@	15.00
Medium Quality, No. 2x.....	13.50	@	14.00
Standard Virginia, No. 1x.....	14.50	@	15.00
Standard Virginia, No. 2x.....	14.00	@	14.50
Medium Va. and Southern, No. 1x.....	14.25	@	14.50
Medium Va. and Southern, No. 2x.....	13.75	@	14.00
Standard Penna. and Virginia Forge.....	13.00	@	13.50
Ordinary Forge.....	12.50	@	13.00
Hot-Blast Charcoal.....	18.50	@	21.00
Cold-Blast Charcoal.....	24.00	@	26.00

Steel Billets.—Holders are asking higher prices, say \$25 @ \$25.50 for deliveries at mills near-by, but only a few small lots have been taken at medium figures. Large consumers are not inclined to pay any such figures until there is a positive necessity for so doing, as in the event of a general resumption of work it is thought that prices would soon weaken. As a matter of fact, everything hinges on the labor question. Protracted suspension of work would necessarily stiffen prices, while resumption may be expected to reverse that tendency. The position is a little unsettled, but neither side seems to show much anxiety in regard to the matter, although in the meantime those who are in a position to make deliveries want full prices for anything they have to offer.

Steel Rails.—No change of any importance. The demand is fairly active, but is not by any means what was expected earlier in the season. The five months' deliveries were about 560,000 tons of heavy sections, so that the indicated consumption is not likely to go much beyond that of last year, perhaps a little over 1,500,000 tons all told. Sales during the six months were about 860,000 tons, which is probably a fair indication of the year's business. Prices steady at \$30, f.o.b. cars at mills.

Bars.—In consequence of the suspension of work at the mills, there has been quite a heavy demand, and prices are decidedly stronger. In some cases large lots have been asked for by parties who were quite willing to stock up at about 1.65¢ for first class Bars, but manufacturers are equally alive to the situation, and if any one wants Bars to-day they would have to pay considerably more money. This does not necessarily mean permanently higher prices, or that there is a demand for Bars which cannot be met. Temporarily there is a little scarcity, and if the shut down is at all general, or becomes more protracted than usual, prices may advance still further, but such a contingency is by no means probable. The fact that there is an immense capacity waiting to be employed should be a sufficient answer to those who are figuring on a "boom" based on a lock-out at the mills. Let enough legitimate business come in at prices now asked, and in a week's time we venture the assertion that there will not be many idle mills, but without some such demand strong concerns will be in no hurry to resume operations, unless on terms already offered to

their employees. Nominal prices to-day are 1.75¢ @ 1.80¢, but there are no large orders to be had unless at about the same figures as ruling during the past two or three weeks.

Plates and Shapes.—The market is easily \$1 @ ton higher, with a heavy, active demand for nearly everything. Several large orders have been taken recently, and mills are all comfortably situated as regards work during the next six or eight weeks. Prospects for additional business are also extremely satisfactory, so that for the remainder of the year it is expected that there will not be more business, but better prices. At the same time, it must not be forgotten that the strength of the market is due in some measure to the uncertainty in regard to labor. It is not hard to get \$1 a ton advance on a few carloads of material when nearly all the mills in the country are closed, and with more or less uncertainty as to when they will resume, but the feeling may be very different if they all decide to resume operations in course of a week or ten days. Meanwhile we repeat last week's quotations, although a full collar and in some cases more than that is obtained for July deliveries; later dates if wanted are not quite as firm, but in most cases buyers postpone placing orders unless for something required for immediate use:

Iron	Steel
Tank Plates.....1.80 @ 1.90¢	1.75 @ 1.85¢
Shell.....	2.10 @ 2.20¢
Flange.....2.70 @ 2.90¢	2.30 @ 2.40¢
Fire Box.....3.00 @ 4.00¢	2.60 @ 2.80¢
Special qualities.....	3.25 @ 3.75¢
Angles.....	1.80 @ 1.85¢
Universal Plates.....	1.85 @ 1.90¢
Beams or Channels.....	2.00 @ 2.15¢
Tees.....	2.20 @ 2.30¢

Chicago.

(By Telegraph.)

Office of The Iron Age, 59 Dearborn street, Chicago, July 6, 1892.

The situation here has changed to some extent during the past week, the influence on Pig Iron and manufactured products being of a diverse character, Pig Iron, especially Southern Coke, is weaker, while Manufactured Iron and Steel are stronger. The shut down of so many Western mills has been felt at once. It has been supposed that consumers would have covered their requirements for the immediate future, even if they thought that the shut down would be only temporary. This has not generally been the case. Quite a number of important consumers are now in the market endeavoring to place orders for immediate delivery and insisting that they must have the material in order to carry out their own contracts. The representatives of non-union mills have been benefited by this condition of affairs and have done considerable business coming to them in this way. Stocks held here by dealers have also been drawn upon rather heavily for the past few days, and are being depleted too rapidly to suit the holders. It remains to be seen whether this is merely a spurt or whether it means a better and stronger demand for all classes of finished material for some time to come.

Pig Iron.—Negotiations for local Coke Pig Iron have resulted in quite a number of sales, but, as stated in recent reports, these are largely renewals of old contracts, and have not to any considerable extent been the subject of general competition. Prices have consequently been maintained at recent figures. In Southern Coke Pig Iron, however, the situation is radically different. The approach of the semi-annual interest paying period has very probably compelled some of the Southern companies to convert stock on hand into cash, and, therefore, has led to sales at concessions. Quite a quantity of No. 2

Southern Foundry is known to have been sold at little, if anything, above \$9.50 at the furnaces. Very low sales are also reported of Southern Gray Forge, but not for this particular market. The leading Southern companies have for some time been holding their prices a shade above their competitors, but now have been compelled by the force of circumstances to come down to the same level and are seeking for business. This change of front in the South is regarded with some uneasiness by Northern Pig Iron manufacturers who have been of the belief that the force of the Southern competition recently felt was over for the present. The sales of Southern Iron at low prices have been for extended deliveries. Lake Superior Charcoal Pig Iron has been somewhat active, with sales ranging from 100 to 1000 tons each. The purchasers represent all classes of consumers. The largest consumers are still holding off and endeavoring to work the market down to \$16, but so far their efforts have proved unsuccessful. The sales made the past week were at full quotations. Quotations are as follows, cash, f.o.b. Chicago:

Lake Superior Charcoal.....	\$16.50 @ \$17.00
Local Coke Foundry, No. 1.....	14.50 @ 15.00
Local Coke Foundry No. 2.....	14.00 @ 14.50
Local Coke Foundry No. 3.....	13.50 @ 14.00
Local Scotch.....	15.00 @ 16.00
Ohio Strong Softeners.....	16.25 @ 17.00
Southern Coke No. 1.....	15.00 @ 15.50
Southern Coke, No. 2.....	13.50 @ 13.75
Southern Coke, No. 3.....	13.10 @ 13.35
Southern, No. 1 Soft.....	13.50 @ 14.00
Southern, No. 2 Soft.....	13.25 @ 13.50
Southern Gray Forge.....	12.75 @ 13.25
Southern Mottled.....	12.75 @ 13.25
Tennessee Charcoal, No. 1.....	17.50 @ 18.00
Alabama Car Wheel.....	21.00 @ 23.00
Coke Bessemer.....	@ 16.00
Hocking Valley, No. 1.....	17.00 @ 17.50
Jackson County Silvery.....	17.00 @ 17.50

Bar Iron.—A few sales are reported, but only by representatives of non-union mills, who are getting 1.60¢, Chicago, half extras, for such contracts as they feel disposed to make. These manufacturers are maintaining a firm front, believing that in a week or so they will be able to get considerably more money if the strike continues beyond that time. The Ohio mills are very generally refusing to make any quotations whatever on Iron for July delivery. Jobbers are quoting 1.80¢ from store as their minimum price, and this only to the very best class of customers. Inquiries are large and stocks are being depleted rapidly. Sales have been made of Soft Steel Bars at 1.70¢, Chicago, in lots of 100 tons, notwithstanding the low prices reported to have been made on heavy season contracts for agricultural works. The makers of Soft Steel are in somewhat better shape than the Bar-Iron manufacturers, but they are refusing to receive orders for delivery before the 15th of the month. Small orders from store are quoted at 1.90¢ @ 2¢.

Structural Iron.—The New Jersey Steel & Iron Company have secured the Bellefontaine Bridge to be built for the St. Louis, Keokuk & Northern Railroad, which will require nearly 5000 tons of material. The order had been secured by a Chicago bridge works who were not willing to undertake the erection, hence it went to the Eastern concern named. A very good demand has been experienced for Beams and other Structural Material during the week and the minimum price of Beams is now 2.05¢, while 2.25¢ is asked and freely obtained for small quantities from stock. Angles and Sheared Plate are dearer in consequence of the strike and advances are asked of 50¢ to \$1 a ton.

Plates, Tubes, &c.—Non-union mills and Eastern mills are obtaining business to a considerable extent, and are receiving a slight advance for such work as they can undertake for immediate delivery. The dealers report a better demand for Plates from stock than they are willing to meet.

They are turning away large orders which, under ordinary circumstances, they would be glad to handle. Quotations from stock may be continued as given last week, but they are very firm at these figures, with an advancing tendency. An error was made last week in the Boiler Tube quotations, which should have been 65¢ @ 70¢ discount.

Sheets.—The manufacturers of Black Sheets are in the same position exactly as other manufacturers of finished material. They say that 2.90¢ at the mill could easily be obtained for No. 27 Common if they were in a position to guarantee delivery within a reasonable time. Many manufacturers of Galvanized Iron are refusing to take business for delivery within the next two or three weeks. Under the circumstances it is difficult to quote prices. Jobbers are asking 3.20¢ for No. 27 Iron from stock and 65 and 10¢ for Juniata Galvanized.

Merchant Steel.—The large contracts under negotiation alluded to last week are still pending, and it is not now known whether they will be closed within a few days or carried over until the strike is settled. Mill quotations for Open-Hearth Machinery, Spring and Tire Steel are unchanged at 2¢ @ 2.25¢, Chicago. Dealers quote from store Open-Hearth Spring Steel, 2.50¢; Tire, 2.25¢ @ 2.30¢; Crucible Spring, 3.50¢ @ 4¢; Crucible Machinery, 4.50¢ @ 5¢; Tool Steels, 6.50¢ @ 8¢ and upward, according to quality.

Billets and Rods.—No large deals have occurred since the few sales made which were reported last week. Inquiries have been received, but sellers and buyers are too far apart in their views. Manufacturers think they should get a slightly advanced price, while buyers take a bearish view of the situation, and think that as soon as the strike is settled prices will recede to as low a point, if not lower, than the figures recently made. We repeat quotations of \$24.50 for Billets and \$34.50 for Rods.

Rails and Track Supplies.—A very good business has been done in Steel Rails during the past week; the demand has been rather better than the average of recent weeks, carrying out the expectation of the manufacturers as set forth in our reports. The business has been attended with no special features, prices running the same as before, and the demand simply being an outcome of the season. Quotations continue at \$31 @ \$31.50 for standard sections. Fastenings are unchanged at 1.70¢ @ 1.80¢ for Iron and Steel Splice Bars, 2.60¢ @ 2.70¢ for Track Bolts with Hexagon Nuts, 2.10¢ @ 2.15¢ for Spikes.

Old Rails and Wheels.—No transactions have come to light in Old Iron Rails, which are nominally quoted at \$18 @ \$18.25. Old Steel Rails have sold at \$14 for long lengths and \$12.50 for short pieces. Nothing has been done in Old Car Wheels, which are worth from \$14.25 to \$14.75. While this last class of material is very quiet, considerable business could be done if the holders were willing to meet the views of consumers.

Scrap.—The Scrap market is still very dull, being in favor of the buyer, who could almost make his own price for cash. Dealers quote selling prices as follows, per net ton: No. 1 Railroad, \$16 @ \$16.50; No. 1 Forge, \$15 @ \$15.50; No. 1 Mill, \$11; Pipes and Tubes, \$11; Horseshoes, \$16; Sheet Iron, &c., \$7; Cast Borings, \$5.75; Wrought Turnings, \$8; Axle Turnings, \$8.50 @ \$9; Machinery Cast, \$11.50 @ \$12; Stove Plate, \$9; Malleable Cast, \$10; Car Axles, \$18; Fish Plates, \$17.25; Mixed Steel, gross ton, \$10.50 @ \$11; Coil Steel, \$15; Leaf, \$16.50, and Tires, \$12. A lot of mixed Country Scrap was bought this week at \$9.50 @ net ton.

Metals.—Lake Copper has weakened to 12¢ for carloads and 12½¢ in smaller quantities. Casting Copper is unchanged at 11½¢ carloads and 11¢ small lots. Spelter is firm at unchanged quotations: 4.70¢ spot and 4.75¢ @ 4.80¢ futures. Pig Lead has been very active, with sales reported aggregating 1100 tons at 4½¢ @ 4.15¢. The market closed strong, with 4.17½¢ asked. All offerings have been quickly absorbed.

Forster, Backman & Hawes, 636 and 638 The Rookery, Chicago, announce that beginning with July 1, they will have the exclusive sale of Pig Iron made by the Iroquois Furnace Company, at South Chicago. Three distinct brands are made—namely, Iroquois, strong foundry, Sterling Scotch, strong softener, and Peerless, high-silicon softener. Although the furnace has not been in blast a year, its product has already gained an excellent reputation for quality. The firm also handle Southern Pig Iron, and are prepared to make contracts for the sale of Coke.

Pittsburgh.

Office of The Iron Age, Hamilton Building, }
PITTSBURGH, July 5, 1892. }

The Amalgamated Association scale, governing wages in the Western mills for the year 1891-92, expired on the night of June 30, and as yet no settlement has been arrived at governing wages for the year 1892-93, and as a result of this a general shut down of both rolling mills and steel plants has taken place. Notwithstanding the fact that all conferences so far held between the manufacturers and the Amalgamated Association have been barren of results, there are many in the trade who still believe that a settlement of the differences now existing will soon be made. This settlement, it is believed, will be in the nature of a compromise, to be brought about by mutual concessions. That this prediction will prove to be true is the wish of every one, whether directly connected with the Iron and Steel trades or not. On the other hand, there are others just as well informed on the situation who are of the belief that we are on the eve of one of the greatest fights between capital and labor that ever took place. In this early stage of the game it is, of course, impossible to foretell the probable outcome of the present situation. In the course of two or three weeks a majority of the mills will have finished making the repairs now going on, and will therefore be in position to start operations. Until this time comes it will not be known whether the manufacturers will maintain their present stand in regard to refusing to sign the new Amalgamated scale. It is worthy of note, however, that up to this writing not a firm has signed the Amalgamated scale that announced their intentions some time ago of refusing to sign unless some concessions were made. Of course there have been some signers, but in the majority of cases they are concerns that were expected to sign, having always done so heretofore as soon as the scale was presented to them. The shut down of the Iron and Steel mills has, of course, unfavorably affected business in all lines. The persistent efforts of furnacemen to dispose of their product has weakened prices to the extent that contracts for delivery well up to the close of the year are being accepted at present prices. In some other lines, such as Structural Shapes, Steel Plates and Bar Iron, the shut down has stiffened up prices considerably, and in a few cases advanced prices are being obtained. Scrap Iron and Steel of all kinds are dull and neglected and buying is at a standstill.

Pig Iron.—The market for the past week did not show any special features. The almost universal shut down of the mills has caused the withdrawal of a large number of buyers from the market, and this, of course, has unfavorably affected the market. The first six months of 1892 have shown a steady decline in prices that was remarkable. In the table given below we show prices ruling in Pittsburgh for the first six months of this year for Bessemer, Gray Forge and No. 1 Foundry Iron, as follows:

1892.			No. 1.		
	Bessemer.	Gray Forge.		Foundry.	
January 7...	\$15.75@16.00	\$13.50@13.75	\$15.50@15.75		
January 14...	15.75@16.00	13.50@13.75	15.50@15.75		
January 21...	15.75@16.00	13.50@13.75	15.50@15.75		
January 28...	15.50@15.75	13.25@13.50	15.50@16.00		
February 4...	15.50@15.75	13.25@13.50	15.50@16.00		
February 11...	15.50@15.75	13.25@13.50	15.25@15.75		
February 18...	15.20@15.50	13.25@13.50	15.25@15.75		
February 25...	14.90@15.25	13.25@13.50	15.25@15.75		
March 3...	14.75@15.00	12.75@13.00	14.85@15.15		
March 10...	14.50@14.75	12.75@13.00	14.85@15.00		
March 17...	14.50@14.75	12.75@13.00	14.75@15.00		
March 24...	14.5@14.75	12.75@13.00	14.75@15.00		
March 30...	14.00@14.75	12.75@13.00	14.75@15.00		
April 7...	14.00@14.75	12.75@13.00	14.7@15.00		
April 14...	14.50@14.60	12.75@12.90	14.75@15.00		
April 21...	14.40@14.50	12.75@12.90	14.75@15.00		
April 28...	14.35@14.50	12.75@13.00	14.75@15.00		
May 5...	14.35@14.50	12.75@13.00	14.75@15.00		
May 12...	14.25@14.50	12.75@12.85	14.50@14.75		
May 19...	14.25@14.40	12.75@12.85	14.50@14.75		
May 26...	14.25@14.35	12.75@12.85	14.40@14.60		
June 2...	14.10@14.25	12.65@12.85	14.40@14.60		
June 9...	14.10@14.25	12.60@12.75	14.40@14.60		
June 16...	14.00@14.25	12.60@12.75	14.35@14.60		
June 23...	14.00@14.15	12.60@12.75	14.35@14.60		
June 30...	14.00@14.15	12.60@12.75	14.35@14.60		

From the above it will be seen, that the course of the market has been steadily downward, and if the shut down of the mills should prove to be a prolonged one a further decline in prices is possible. We quote the market as follows:

Neutral Gray Forge.....	\$12.50 @ \$12.75, cash
White and Mottled.....	12.25 @ 12.50, "
All-Ors Mill.....	12.50 @ 12.75, "
No. 1 Foundry.....	14.25 @ 14.50, "
No. 2 Foundry.....	13.25 @ 13.50, "
Bessemer Iron.....	14.00 @ 14.10, "
Cold-Blast Charcoal.....	23.50 @ 24.00, "

While we do not quote Bessemer Iron below \$14, reports are going of sales at prices slightly under that figure.

Ferromanganese.—There is no change to note, \$62 @ \$62.50 being the price for domestic, with a fair demand going. No foreign has been sold in this market for some little time.

Soft Steel Billets.—The recent sharp advance in the price of prompt Billets is being fairly well maintained, although the market was hardly as firm last week as during the previous week. This is accounted for in the fact that buyers have covered their immediate requirements to a great extent, and will not enter the market again while present high prices rule unless compelled to do so. There are still some Billets to be obtained for July delivery, and for these sellers are asking from \$23.50 to \$24, with few sales going. Until the wage scales governing steel mills have been signed makers are not disposed to book orders for late delivery, unless fancy prices are paid, and as a result buyers are holding off in the expectation of securing lower prices when the plants have started up again. One of the Pittsburgh mills will probably continue in operation right along, as they have a wage agreement with their men that does not expire for some time yet.

Steel Rails.—A fairly good demand is reported, although no large orders have been placed for some time. The Edgar Thomson mill is running full time and will not close down for repairs, as they were made about the first of the year. Prices remain at \$30, f.o.b. at mill, for standard sections.

Structural Material.—The shut down of the plants making Structural Shapes has brought business almost to a standstill. Makers who are in a position to sell material are reaping the benefits of slightly higher prices for some lines. Should the mills be idle for any length of time it will

be impossible for makers to fill orders at any price. While the market has stiffened up considerably, we make no change in our quotations of last week and quote as follows: Beams and Channels on a basis of 1.90¢ @ 1.95¢ for desirable orders and 2¢ @ 2.05¢ for small lots; Angles, 1.80¢ @ 1.85¢; Universal Mill Plates, Iron, 1.80¢ @ 1.90¢; Universal Mill Plates, Steel, 1.80¢ @ 1.90¢; Tees, 2.35¢; Refined Iron Bars, 1.65¢ @ 1.70¢; Steel Bars, 1.65¢ @ 1.70¢; Sheared Bridge Plates, 1.95¢ @ 2¢. These prices are being firmly maintained, and in some cases better figures than quoted are being obtained.

Steel Plates.—The situation is accurately stated in the remarks made above concerning Structural Material. Orders are being taken subject to stock only and no contracts are being made. We quote as follows: Flange, 2¢ @ 2.10¢; Fire Box, 3.50¢ @ 3.75¢; Shell, 2¢ @ 2.10¢; Tank, 1.75¢ @ 1.85¢, f.o.b. Pittsburgh.

Wire Rods.—There is little or nothing doing. Buyers' immediate wants are well supplied and no contracts for future delivery are being made. The reduction made by the Amalgamated Association on Wire-Rod rolling, which was from 45¢ to 30¢, could well be afforded. We are advised of a Western mill that paid their Rod roller \$60 per day for 26 working days recently, or over \$1500 for the entire month.

Merchant Steel.—Some good orders have been placed recently and business for the next month or two promises to be very large. Prices are very firm and in some lines, slight advances are reported. We quote as follows: Tool Steel from 7¢ up, according to grade; Crucible Spring Steel, 3½¢ @ 4¢; Crucible Machinery Steel, 4½¢ @ 5½¢; Spring, Tire and Machinery Steel from 2¢ to 2.40¢, according to quality.

Muck Bar.—The shut down of the mills has stopped the demand and there is nothing doing. We quote the best grades of Muck Bar at \$24.50, delivered at buyers' mill. Inferior grades have been sold in some instances at slightly less than the above price.

Wire and Cut Nails.—The shut down of the Steel plants and also some of the Wire Nail factories has caused a slight advance in prices, and Wire Nails for delivery in July can scarcely be had at any figure. One concern here has signed the amalgamated scale for Wire-Nail cutting, and will continue in operation right along. Another concern that does not employ Amalgamated Association men will also continue in operation. We quote the market at \$1.60 @ \$1.65 in carload lots, and \$1.70 @ \$1.75 in less quantities. On account of the shut down Cut Nails have also advanced in price, and we now quote at \$1.50 @ \$1.55 in carload lots, f.o.b. at factory in Wheeling or Mahoning Valley districts. In both Wire and Cut Nails some makers are refusing to make contracts, and will only book orders subject to stock.

Barb Wire.—The shut down of the Steel mills has resulted in Wire makers agreeing to accept orders only on condition of ability to obtain Steel. The idleness of the Steel plants has of course made Steel very scarce, and as a result of this prices for both Plain and Galvanized are being firmly maintained. But few orders are being placed, however, and these are at prices quoted last week, which are as follows: \$2.25 @ \$2.35 for Painted, and \$2.65 @ \$2.70 for Galvanized, f.o.b. at factory.

Skelp Iron.—The shut down of the mills has caused a great scarcity of Skelp Iron, and it can hardly be obtained at any price. Previous to July 1 the Pipe mills had pretty thoroughly cleaned up all Skelp Iron in the market, and as the mills are now idle it can hardly be gotten at

any price. We make quotations of 1.65¢ @ 1.70¢ for Grooved and 1.80¢ @ 1.85¢ for Sheared, four months, or 2 % off for cash.

Manufactured Iron.—Since our report of last week another conference was held between the Pittsburgh manufacturers and the Amalgamated Association, but no agreement was arrived at looking to a settlement of the wage question for another year. The attitude of the Pittsburgh manufacturers thus far indicates that some of them at least are prepared to stand out for a reduction on the scale as proposed by the Amalgamated Association. The recent sharp advance in some lines of Manufactured Iron, however, may induce some concerns to sign the scale that otherwise would have remained idle. Another conference is to be held in this city to-morrow (Wednesday), when it is expected something will be done looking to a settlement of the wage scale. While it is true some firms have signed the scale, they are only those concerns who have always made it a practice to sign the amalgamated scale as soon as presented, with the distinct understanding, however, that they will be allowed any concessions made by the Amalgamated Association when the final settlement of the scale is made. It is the impression here that very few signers of the scale will be secured by the Amalgamated Association until necessary repairs have been made, which are now going on in nearly all of the mills. Talk of a compromise at \$5 per ton for boiling is still indulged in and many seem to think that this will be the outcome of the conference held between the manufacturers and the workmen. A few manufacturers in recent interviews have emphatically stated, however, that unless the Amalgamated Association sees fit to make large reductions in labor they will try the plan of operating their mills with non-union men. They agree that this has been done before, and in every case where tried by the manufacturers they have succeeded in gaining their point. The outcome of the conference to-morrow will be watched with considerable interest, as many believe that this will be a final conference, unless a settlement is reached. The shut down of the mills has caused a great scarcity of Bar Iron and other lines as well, and a sharp advance in prices has taken place. The best grades of No. 1 Bars cannot be obtained at less than 1.70¢, and in some cases orders have been booked at 1.80¢. Bars made from Old Rails have also advanced very materially and quotations ranging from 1.60¢ to 1.70¢ are made. Some mills emphatically decline to sell under last named figure. Steel Sheared Plates are also firmer, but we do not change our quotations of 1.85¢ @ 1.90¢, and quote 1.75¢ @ 1.80¢ for Iron Sheared Plates. No. 24 Sheet has advanced from \$2 to \$4 a ton, and is now quoted at \$2.60 @ \$2.65, all 60 days, 2 % off for cash. Mills generally are refusing to make contracts and will only book orders subject to stock on hand. Should the present shut down of the mills be continued for a considerable length of time, further advances in all lines of Manufactured Iron will undoubtedly take place.

Wrought Iron Pipe.—The shut down of the mills and the consequent scarcity of Skelp Iron has brought about a firmer tendency in prices for both Pipe and Tubes. Some good-sized orders have been booked by the manufacturers, and it is feared a little trouble will be experienced in obtaining Iron to fill them. We are advised that the report that the Pipe and Tube makers had agreed to shut down for 30 days is without foundation. At the last meeting of the Wrought Iron Pipe and Tube Manufacturers' Association, held in this city, Joseph Brown of Pittsburgh was appointed temporary secretary to take

the place of Jas. H. Murdock, who was compelled to give up his position on account of declining health. While prices are firmer, as stated above, but little attention is being paid the official discounts of the association, and they still continue to be shaded very materially.

Scrap Iron and Steel.—The shut down of the mills has stopped what little demand there was for Scrap Iron and Steel material, and prices have shown further decline. There are many in the market that have Scrap to sell, but few buyers can be found. When a buyer is found, however, he has such advantages that he can get material at almost any price he cares to pay for it. In the present condition of the market it is absolutely impossible to correctly quote prices, as there is such a wide range in prices asked by the seller and what are actually paid by the buyer. Owing to these conditions we have omitted quotations for the present.

Old Rails.—The same remarks made in regard to Scrap Iron and Steel apply to Iron and Steel Rails, for which there is little or no demand. In the present condition of business it is hard to get at just what prices are going for material of this kind, but from a few sales reported to have been made last week we make quotations as follows: Old Steel Rails, which do not require sorting, \$15.75 @ \$16; miscellaneous lengths we quote at \$15 @ \$15.25 and long lengths at \$15.50 @ \$15.75.

Jno. G. A. Leishman, vice-chairman of Carnegie Steel Company, Limited, of Pittsburgh, who has been in Europe for the past four months, returned to that city last week. During his absence abroad Mr Leishman combined business with pleasure and reports having had a very enjoyable time.

W. L. Abbott, formerly chairman of Carnegie, Phipps & Co., Limited, Pittsburgh, who with his family has been sojourning in Europe for some time past, returned to his home in Pittsburgh last week.

St. Louis.

Office of *The Iron Age*,
Bank of Commerce Building,
St. Louis, July 5, 1892

Pig Iron.—The market has been very quiet during the past week, and prices are not as firm as they were ten days since. The labor troubles are causing more or less uneasiness, and it is plain to be seen that should the shut down in the mills be of long duration Pig Iron will suffer. Furnacemen are keeping in close to shore, however, and are not disposed to accept business at low prices simply because their order books are empty. Prices have reached a point which no doubt precludes any profit, unless a furnace is unusually well located. Those who have blown out do not see any immediate opportunity to blow in, and production thus continues to show a gradual decrease. July and August will more than likely be dull months, and it would not be strange to see prices go a shade lower, although it is difficult to see how they can. Lake Superior Irons have been selling quite freely of late, as the prices at which they are offered are so close that consumers are willing to take the chances of a still lower market. Gray Forge also remains weak and unsettled. The situation as a whole does not contain much encouragement either for the buyer or the seller, and the immediate future is void of any sign of improvement. For ordinary quantities we quote as follows for cash, f.o.b. St. Louis:

Southern Coke, No. 1 Foundry, \$14.00 @ \$14.25
Southern Coke, No. 2 Foundry, 13.25 @ 13.75
Southern Coke, No. 3 Foundry, 12.00 @ 13.00

Gray Forge.....	12.25 @ 12.50
Southern Charcoal, No. 1 Foundry.....	15.75 @ 16.25
Southern Charcoal, No. 2 Foundry.....	15.00 @ 15.50
Missouri Charcoal, No. 1 Foundry.....	14.50 @ 15.00
Missouri Charcoal, No. 2 Foundry.....	14.00 @ 14.25
Ohio Softeners.....	17.00 @ 17.25

Bar Iron.—The increased trade noted last week continues a feature of this department. Agricultural implement dealers have recently placed some large orders at current prices, and car manufacturers have also been buyers. The outlook is considered encouraging both as regards prices and volume of business. Mills quote 1.62½¢ @ 1.65¢, half extras, East St. Louis. Jobbers quote 1.70¢ @ 1.75¢ for lots from store.

Barb Wire.—Trade has fallen off somewhat since our last report. The Western country has been deluged with incessant rains which almost entirely prevent outside work, and stocks of Wire remain unsold in dealers' hands which ordinarily would have been sold. Naturally this has weakened prices and there does not appear to be any immediate prospect of improvement in this direction. Mills quote as follows: Painted, \$2.30; Galvanized, \$2.75. Less than car lots 10¢ p cwt, additional. Terms 60 days, or 2 % discount for cash.

Wire Nails.—The slight improvement noted in last week's report continues. Mills report an increased trade and the local building trade gives promise of increased activity. Mills quote \$1.75 p keg for any quantity.

(By Telegraph.)

Pig Lead.—The improvement noted last week continues, and prices are hardening. Sales are reported of several hundred tons at 4.05¢, and holders ask 4.10¢, with bids of 4.07½¢. It is difficult to account for the sudden demand, although it is pretty generally understood that there is not very much stock on hand, and a slight improvement in demand is immediately reflected in prices.

Spelter.—This metal does not improve at all. Sales are reported at 4.60¢. The outlook for any immediate improvement cannot be called encouraging, although prices seem well fixed at 4.60¢, and it is doubtful if sales would be made at less than this figure.

Cleveland.

CLEVELAND, OHIO, July 5, 1892.

Iron Ore.—There have been a few sales of Non-Bessemer during the past week at figures from 15¢ to 30¢ p ton below those obtained for the same Ores last year. The market is by no means active, but certain buyers are taking advantage of the situation in the Pig-Iron market and are gathering in their favorite grades of Ore at very advantageous figures. About 40,000 tons of Non-Bessemer Hematites were sold during the past ten days. Only a few sales of Bessemer are recorded, and for these the prices paid are quite carefully guarded. It is known that last year's quotations were shaded, and that unless there is a change for the better there will likely be further changes in the purchasers' favor. The receipts at Cleveland of new Ore for the week just closed aggregated 82,000 tons, as compared with 57,000 tons for the corresponding week in 1891. At all Lake Erie ports the receipts from the Lake Superior district amounted to nearly 160,000 tons, as against 110,000 in the same length of time last year. The Escanaba rate remains at 70¢ despite all

efforts to inflate it. From Ashland and Two Harbors the vesselmen receive \$1.10 per ton—a rate that means small profits, if any, to the carriers. Shipments to the furnaces have suddenly dropped down to very low figures. Only 28,000 tons were sent out last week, as against 41,000 tons for the same week in 1891. For the month of June, 1892, however, the shipments were 215,000 tons, against 90,000 tons in June, 1891. Dealers expect to sell considerable Ore this month. The vesselmen are working hard for better rates, but do not seem likely to obtain them. Oremen will meet any upward tendency in lake freights with a big reduction in shipments, inasmuch as there is little or no demand for Ore for immediate use. Negotiations for a few fairly large amounts of both Bessemer and Non Bessemer Ore are pending and will be closed when the wage questions are settled.

Pig Iron.—An inquiry for 6000 tons of Bessemer Iron is said to have been responded to by ten local dealers, an indication of the hold the buyers have just at present upon the situation. The market is so dull that even the interruption of a universal holiday has no perceptible effect. Some dealers look for better things early in August, while others fear a continuation of the present depression for several months, as some of the early season sales are said to have been deliverable in 1893. Nominal quotations are as follows:

Nos. 1 to 6 Lake Superior Charcoal	\$17.50 @ \$18.05
Nos. 1, 2 and 3 Bessemer, per ton.	15.00 @ 15.30
No. 1 Strong Foundry, per ton.	15.00 @ 15.50
No. 2 Strong Foundry, per ton.	14.00 @ 14.50
No. 1 American Scotch, per ton.	15.00 @ 15.60
No. 2 American Scotch, per ton.	14.00 @ 14.60
No. 1 Soft Silvery, per ton.	15.50 @ 16.50
Mahoning and Shenango Valley	
Neutral Mill Irons, per ton.	13.50 @ 14.00
Mahoning and Shenango Valley	
Red Short Mills, per ton.	14.00 @ 14.50

Old Rails.—Plenty of Old Americans are to be had at \$19 @ \$19.50, with only a slight demand.

Nails.—Prices are firm at \$1.70 for Steel Wire, and \$1.65 for Steel Cut Nails, in stock.

Scrap.—The market is so devoid of life that quotations are of small significance. Quotations are nominally as follows: No. 1 Railroad Wrought, \$16.25 @ \$16.50; Cast Scrap, \$12 @ \$12.25; Wrought Turnings, \$11 @ \$11.50, Cast Borings, \$8 @ \$8.50.

Cincinnati.

(By Telegraph.)

Office of The Iron Age, Fourth and Main Sts., CINCINNATI, July 6, 1892.

The volume of business in Pig Iron has been unusually small during the week, there being no large business, and even the consumptive orders for immediate shipment were smaller than usual. The fact that most of the mills are not in operation, owing largely to the disorganized condition of labor, has led to numerous applications for the postponement of deliveries of Pig Iron on contracts, and this is one reason for the light current consumptive order trade. There have been such liberal sales during the month of June that most of the furnaces are content to wait for an improved demand, so that there is no quotable change in prices of the leading markets, and although it is more of a buying than a selling market the weakness, if there is any, is not made in prices. Concessions would be difficult if not impossible to obtain, though it is not quite so certain that the buyers could not exact more favorable terms of delivery. What little demand there is is running more on Charcoal than on Coke Iron. The market as a rule may be called steady. Quotations are as follows:

Foundry.	
Southern Coke, No. 1.	\$13.75 @ \$14.00
Southern Coke, No. 2.	12.50 @ 13.00
Southern Coke, No. 3.	12.00 @ 12.50
Ohio Soft Stone Coal, No. 1.	16.00 @ 16.50

Ohio Soft Stone Coal, No. 2	15.00 @ 15.50
Mahoning and Shenango Valley	16.00 @ 17.25
Hanging Rock Charcoal, No. 1	19.75 @ 20.00
Hanging Rock Charcoal, No. 2	19.00 @ 19.50
Tennessee and Alabama Charcoal, No. 1	16.50 @ 17.00
Tennessee and Alabama Charcoal, No. 2	15.50 @ 16.00

Forge.	
Gray Forge	11.50 @ 12.00
Mottled Neutral Coke	11.25 @ 11.50

Car Wheel and Malleable Irons.	
Standard Southern Car Wheel	18.75 @ 19.00
Lake Superior Car Wheel and Malleable	17.75 @ 18.00

Louisville.

LOUISVILLE, KY., July 5, 1892.

There has been quite free selling during the past week for deliveries running through 12 months, and sales made of No. 2 Foundry to agricultural companies on the basis of \$9.75 at furnace for the deliveries mentioned. There has been no advance in prices, and it is thought that the trouble with the Amalgamated Association is such that a further change in values will not take place until the difficulty is settled. Rolling mills recently have been very busy, but in some instances this was in anticipation of what has happened, and mills were run with a view of getting out as large tonnage as possible with the expectation of a strike. The situation in the South is improving, and crops in the West are such that it is felt that another great harvest may be expected, which will increase the wealth of that district and have a most favorable effect upon the prosperity of the country in general. Charcoal Irons show no improvement, and low prices prevail.

We quote for cash, cars, Louisville:

Southern Coke, No. 1 Foundry	\$13.75 @ \$14.25
Southern Coke, No. 2 Foundry	12.75 @ 13.25
Southern Coke, No. 3 Foundry	12.00 @ 12.50
Southern Coke, Gray Forge	11.50 @ 12.00
Southern Charcoal, No. 1 Foundry	15.75 @ 16.75
Southern Car Wheel, standard brands	18.00 @ 19.00

New York.

Office of The Iron Age, 96-102 Reade street, New York, July 6, 1892.

Pig Iron.—The Thomas Iron Company have announced to-day the following prices: No. 1x Foundry, \$15; No. 2 Foundry, \$14; and Gray Forge, \$13.50, tidewater delivery. It is, of course, too early to state how large a quantity of Iron will be booked at these figures. To some extent other producers in the Lehigh and Schuylkill valleys have been close to these figures, while on Mill Iron even lower prices have been made. Thus \$12.25 at furnace has been accepted in the Schuylkill Valley on Mill Iron, while in the Lebanon Valley No. 3 Cornwall is being offered at \$13 at furnace. We quote Northern brands at \$15 @ \$15.50 for No. 1; \$14 @ \$14.50 for No. 2; \$13.50 @ \$13.75 for Gray Forge, tidewater. Southern Iron, same delivery, \$14.50 @ \$15 for No. 1; \$13.50 @ \$14.50 for No. 2 and No. 1 Soft; \$13 @ \$13.50 for No. 2 Soft; \$12.50 @ \$13 for Gray Forge.

Ferromanganese and Spiegeleisen.—The market is without any features of interest. We quote 80 % Ferro \$59.

Steel Rails.—An Eastern mill has closed with the Georgia Central for a 10,000-ton lot, and there are negotiations pending for an equal amount for another road. Prices remain unchanged at \$30 at Eastern mill.

Manufactured Iron and Steel.—Little new business for future delivery has been done outside of one lot of 500 tons of Beams. As yet the house-smiths' strike does not seem to have affected current consumption, and some of the concerns who have season contracts with Western mills are having orders filled

by local works. The Eastern Beam mills are pretty full for this month, and the capture of a 5000-ton bridge order for the West by one of them makes their position easier still. Little business has been done in Plates or Bars. Nominal prices, subject to concessions on good specifications, are as follows: Beams, 2.25¢ @ 2.65¢ for small lots and 2.15¢ @ 2.50¢ for round lots, according to sizes; Angles, 1.85¢ @ 2¢; Sheared Plates, 1.8¢ @ 2.25¢; Tees, 2.30¢ @ 2.75¢; Channels, 2.25¢ @ 2.50¢, on dock. Car Truck Channels, 2¢ @ 2.10¢. Steel Plates are 1.8¢ @ 1.9¢ for Tank; 2¢ @ 2.25¢ for Shell; 2.30¢ @ 2.65¢ for Flange; 2.5¢ @ 2.75¢ for Marine, and 3¢ @ 3.25¢ for Fire Box, on dock; Refined Bars are 1.7¢ @ 1.9¢, on dock; Common, 1.6¢ @ 1.65¢. Scrap Axles are quotable at 2¢ @ 2.10¢, delivered. Steel Axles, 2¢ @ 2.1¢, and Links and Pins, 2.05¢ @ 2.20¢; Steel Hoops, 1.90¢ @ 2¢; Cotton Ties, 85¢ per bundle, delivered.

Track Material.—The market is very dull, with quotations as follows: Spikes, 1.90¢ @ 2¢, delivered; Fish Plates, 1.55¢ @ 1.60¢, at mill; Track Bolts, square nuts, 2.50¢ @ 2.60¢, and hexagon nuts, 2.70¢ @ 2.80¢, delivered.

Stock Warrants.—The American Pig Iron Storage Warrant Company report as follows:

	Tons.
Stock in yard June 30, 1892	67,700
Put in yard for 10 days ending June 30, 1892	5,300
Total	73,000
Withdrawn 10 days ending June 30, 1892	100
Net stock in yard June 30, 1892	72,900

The United States Projectile Company of First avenue and Fifty-third street, Brooklyn, are in the market for about 1000 tons of Steel for the manufacture of their projectiles.

Metal Market.

Copper.—Lake Superior Ingot has been selling in moderate quantities, chiefly from second hands, at 11½¢ @ 11¾¢. Common casting Copper is offered at 10¾¢, and is understood to have been sold at a fraction less. These figures are evidently a fair reflection of current market values. In any event, they are the rates at which purchases can yet be made, although somewhat below the "nominal" prices quoted by large producers. Business in the metal has been moderate, and the demand at present is spiritless, although consumption is represented as being large in the manufacture of electrical supplies and fully up to the average in other lines. It is reported that some disagreement as to the selling of Anaconda and Montana product is having more or less unfavorable effect upon the market for the same and indirectly upon values of Lake product. The nature of the misunderstanding is not made public, however, and whether it will lead to a rupture in the agreement to regulate production and exports is problematical. On the exchange 50,000 lb Lake Ingot were sold at 11½¢ and additional parcels were subsequently offered at the same price, net cash terms.

Pig Tin.—The movement in prices has been moderate and the market has developed no distinctly new feature. Some transfer of speculative holdings has taken place, but the change alters the position of supplies in no important degree and new ventures are engaged in very cautiously. As a matter of fact, speculation has been confined chiefly to the evening up of old deals and purchases by jobbers and consumers are limited as closely as possible to clearly defined wants. Futures are still at a discount in the London

market while commanding a premium here, and the probability of purchases being made in New York for shipment to Europe against "short" sales is, therefore, extremely vague. Thus far about 300 tons intended for the American market have been detained in London and more or less supply drawn from the Continent as well, evidently for delivery on "short" contracts; but that the "bull" leaders were disconcerted is improbable, since prices are fairly well supported in the face of an increase in the visible supply. The latter, according to data bulletined on the Metal Exchange, was 12,848 tons July 1, against 12,333 tons on June 1. The American spot supply is shown to have increased about 700 tons and the quantity afloat to have decreased 300 tons. On the other hand, stocks in Europe dropped off to the extent of about 850 tons, while the amount in transit for that quarter increased 865 tons during the month. Compared with that of a year ago, the visible supply shows 803 tons increase, and as far as statistics are any criterion, operators for a rise would seem to have a somewhat troublesome deal to handle. Sales on the exchange on Wednesday included 25 tons August-September shipment from the East at £98. 10/-, landed here, and 50 tons buyers' option to July 13, at 21.15¢. At the close spot lots were quoted at 21.10¢ bid, 21.20¢ asked.

Pig Lead.—Prices have undergone a further slight advance and the market is apparently firm, although local buying is on more conservative lines at the moment. Probably 500 tons have been sold for prompt and near future delivery, in lots of 50 tons upward, at from 4.20¢ to 4½¢, with latest dealings at the higher rate; for smaller parcels corresponding prices have been realized. The offering here at present is moderate, unsold supplies are still light and the offering from the West is more reserved than it has been for sometime past. There were sales on Wednesday of about 200 tons at 4½¢, near future delivery.

Spelter.—Western brands are quoted at 4.80¢ @ 4.85¢ for prompt and a fraction less for future shipment, but the offering is not urgent. Purchases by galvanizers have continued on a fairly liberal scale and serve to give the market a good measure of support. In other directions, however, the movement is slow and barely up to the average for the season.

Antimony.—Demand has been of ordinary character and prices have undergone very little change. We quote at 11¢ for Hallett's, 12¢ for LX and 14½¢ for Cookson's, in wholesale quantities.

Tin Plate.—In this line business has been quiet and the temper of the market is practically the same as it was a week ago. We quote as follows for full weights: Coke Tins—Penlan grade, IC, 14 x 20, \$5.25; J. B. grade, do., \$5.37½; Bessemer do., \$5.25; light weights, 100-lb, 10¢ less; 95-lb, 20¢ less; 90-lb, 30¢ less than full weight; Siemens Steel, \$5.37½. Stamping Plates—Bessemer Steel, Coke finish, IC basis, \$5.60 @ \$5.65; Siemens Steel, IC basis, \$5.75 @ \$5.80; IX basis, \$6.80. IC Charcoals—Melyn grade, ½ X, \$6.40; for each additional X add \$1.50; Allaway grade, \$5.75; Grange grade, \$5.85; for each additional X add \$1.20. Charcoal Ternes—Worcester, 14 x 20, \$5.75; do., 20 x 28, \$11.45; M. F., 14 x 20, \$7.37½; do., 20 x 28, \$15.25; Dean, 14 x 20, \$5.45; do., 20 x 28, \$10.80; D. R. D. grade, 14 x 20, \$5.35; do., 20 x 28, \$10.40 @ \$10.45; Mansel, 14 x 20, \$5.30; do., 20 x 28, \$10.45; Alyn, 14 x 20, \$5.45; do., 20 x 28, \$10.65; Dyffryn, 14 x 20, \$5.65; do., 20 x 28, \$11. Wasters—S. T. P. grade, 14 x 20, scarce; do., 20 x 28, \$10; Abercarne grade, 14 x 20, scarce; do., 20 x 28, \$9.80.

Coal Market.

The effect of the latest advance in prices made a week ago is to stop business. But there is a comparatively large number of orders on the books at former prices which are in course of delivery. The prices now stand as follows, compared with prices at the beginning of the year:

	January.	July.	Increase.
Stove.....	\$.45	\$4.50	\$1.05
Chestnut.....	3.10	4.40	1.30
Egg.....	3.30	4.30	.90
Grate.....	3.25	3.90	.65

In the trade at large, even among prominent firms governed by the combine the advanced prices are not regarded with favor, but to acquiesce seems to be regarded as the only alternative. The pressure upon the market of Bituminous Coal is felt more and more, and, in the opinion of many, threatens the permanent displacement of its rival in a considerable department of the trade. Gas and oil stoves also came more into favor, and, in the aggregate, materially affect the consumption of mineral fuel. Still, the combine would have it understood that a few months will bring about a normal condition and a stability in prices more conducive to the interests of all concerned than the irregularity experienced under former conditions. The week's production was 897,352 tons; total for the year, 18,605,140 tons, an increase of 984,600 tons over the same time last year; Philadelphia & Reading tonnage for the week, 590,000; Pennsylvania Railroad, 277,115 tons. Coke is in active demand, but extremely low in price.

The Reading road has applied to the Dock Board for permission to establish a ferry slip at the foot of West Twenty-fourth street in this city, to communicate with Communipaw.

Financial.

The most notable feature in the week is the passage of the silver bill in the Senate—yeas 29, nays 25. The question now is, What will the House do with it. The chances are supposed to be decidedly against its success, as the same parties who antagonized the Bland bill are hostile to the new measure as it now stands. It reads as follows:

That the owner of silver bullion may deposit the same at any mint of the United States to be coined for his benefit, and it shall be the duty of the proper officers, upon the terms and conditions which are provided by law for the deposit and coinage of gold, to coin such bullion into the standard dollars authorized by the act of February 28, 1878, entitled "An act to authorize the coinage of the standard silver dollar and to restore its legal-tender character, and such coins shall be a legal-tender for all debts and dues, public and private." The act of July 14, 1890, entitled "An act directing the purchase of silver bullion and the issue of Treasury notes thereon, and for other purposes," is hereby repealed.

Provided, that the Secretary of the Treasury shall proceed to have coined all the silver bullion in the Treasury purchased with silver certificates.

The Anti Option bill is still an incubus on the market, but action at this session of Congress is thought improbable. Gold exports cause little concern. London papers promise a return flow of importance in the coming autumn, and the Treasury at Washington is in no pressing need. The money circulation of the country is greater by \$100,000,000 than it was a year ago. On June 1, 1891, it was reported at \$1,504,000,000, and on June 1, 1892, at \$1,620,000,000. It may be well to note that the exports of gold thus far this year have been in round numbers \$45,000,000, against shipments during the spring and summer of 1891 of at least \$77,000,000.

The stock market was sluggish. On Friday the announcement of the engagement of \$3,200,000 gold for export to

Europe aided in making the tone heavy. Chicago dispatches repeated the rumor of a suit against the Chicago Gas. The crop situation in the West was reported as good and the weather excellent for harvesting. There was an indisposition to operate in stocks beyond a very limited extent. In the bond market there was gratifying improvement, reflecting the reinvestment of July interest. There was very little foreign demand for bonds, however, most of the interest coming due July 1 on foreign-owned securities having been remitted, which accounts in large measure for the heavy gold exports of the past few days.

In stocks on Monday the effect was a material drop in prices, and there was a flurry in call loans, but there were no further engagements of gold, which was reassuring.

United States bonds are quoted as follows:

U. S. 4½s, 1891, extended.....	100
U. S. 4s, 1907, registered.....	116½
U. S. 4s, 1907, coupon.....	116½
U. S. currency 6s.....	106

British Iron and Metal Markets.

[Special Cable Dispatch to The Iron Age.]
LONDON, WEDNESDAY, July 6, 1892.

The only feature of interest in the Iron warrant market has been a practical cornering of the "bears" in Cleveland Iron, many of whom, it is reported, were forced to settle on the basis of 50/-, owing to extreme scarcity of cash warrants. In Scotch and Hematites the movement has been light and little interest manifested. Prices for Cleveland receded after the closing of "short" accounts, but otherwise the changes have been slight. Stocks in Connal's stores are now 426,000 tons Scotch and 39,000 tons Cleveland. There are now 77 furnaces blowing in Middlesbrough and 35 in Cumberland.

Tin has been dull, owing chiefly to want of American support, but lots forced upon the market have been cleared, and prices showed greater firmness afterward. Visible supply increased 768 tons last month, and Americans are reported to be holding the majority of the stock.

Copper prices have averaged somewhat lower, but concessions failed to attract buyers, and the market is rather dull. Chili charters last month were 1600 tons. Late sales of furnace material include 600 tons Montana Argentiferous Matte on private terms, and 500 tons do. at 9/4½. Imports of Copper last six months 4867 tons, and the deliveries 1149 tons less than during the corresponding period last year.

Tin Plate market has continued very quiet, and prices are easier, owing to slowness of demand and lower cost of Block Tin.

Scotch Pig Iron.—Makers' brands have met with slow sale, but prices are held very steady.

No. 1 Coltness, f.o.b. Glasgow.....	53/-
No. 1 Summerlee, " ".....	52/-
No. 1 Gartsherrie, " ".....	50/6
No. 1 Langloan, " ".....	50/6
No. 1 Cambro, " ".....	44/-
No. 1 Shotts, " at Leith.....	51/-
No. 1 Glengarnock, " Ardrossan.....	50/-
No. 1 Dalmellington, " ".....	47/6
No. 1 Eglinton, " ".....	46/6

Steamer freights, Glasgow to New York, 1/-; Liverpool to New York, 7/6.

Cleveland Pig.—Makers' prices have dropped, owing to the decline in warrants. Sellers now at 40/- for No. 3 Middlesbrough, f.o.b.

Bessemer Pig.—No change in the demand and the market flat, with sellers at 50/ for West Coast brands, Nos. 1, 2 and 3, f.o.b. shipping port.

Spiegeleisen.—The market remains dull and unchanged. English 20 & quoted at 77/6, f.o.b. shipping port.

Steel Rails.—Business moderate and no change in makers' prices. Heavy sections quoted at £4. 2/6, f.o.b. shipping port.

Steel Billets.—A moderate business passing and prices easy. Bessemer, 2½ x 2½ inches, quoted at £4. 5/, f.o.b. shipping point.

Steel Blooms.—The market very quiet and unchanged. Makers quote £4 for 7 x 7, f.o.b. shipping point.

Steel Slabs.—Sales light and at about former prices. Bessemer quoted at £4. 5/, f.o.b. at shipping point.

Old Iron Rails.—Little is doing in this line, and prices about as before. Tees quoted at £3. 17/6 and Double Heads at £3, f.o.b.

Scrap Iron.—Only moderate demand and prices without change. Heavy Wrought Iron quoted at £2. 10/ @ £2. 12/6, f.o.b.

Crop Ends.—Market dull and unchanged. Bessemer quoted at £2. 12/6 @ £2. 15/, f.o.b.

Manufactured Iron.—There is no improvement in the demand, and sellers ask former price. We quote, f.o.b. Liverpool:

	£ s. d.	£ s. d.
Staff, Ordinary Marked Bars	8 10 0	8 10 0
Common	6 5 0	6 7 6
Staff, Bk Sheet, singles	7 5 0	7 5 0
Welsh Bars (f.o.b. Wales)	5 10 0	5 10 0

Tin Plate.—Market very quiet and rather flat. We quote, f.o.b. Liverpool:

IC Charcoal, Alloway grade	14/6 @ 15/
IC Bessemer Steel, Coke finish	12/6 @ 12/9
IC Siemens	12/9 @ 13/
IC Coke, B. V. grade 14 x 20	12/6 @ 12/9
Charcoal Tonne, Dean grade	12/ @ 12/3

Pig Tin.—Market closed rather weak at £99 for spot and £97. 5/ @ £97. 10/ for three months' futures.

Copper.—Little doing at the close and the market easy. Merchant Bars quoted at £44. 12/6, spot, and £45. 2/6, three months' futures. Best selected, £48. 15/.

Lead.—Business has been slow and prices are easy at £10. 7/6 for Soft Spanish.

Spelter.—Only routine demand, and the market easy at £21. 12/6 for ordinary Silesian.

Union Furnace of the Union Iron Company, at Detroit, Mich., was blown out June 15, on account of the breaking of the fly wheel of the blowing engine. The company expect to resume operations August 1.

Abendroth & Root Mfg. Company have lately taken an order from the New York Steam Company for a 310 horse-power boiler, and they have also shipped a 150 horse-power boiler to the Tidewater Oil Company, which is to be used on the pipe line, this being their fourth order from this company.

The tin-plate department of the Niedringhaus rolling mill was burned on the 5th inst.

The Homestead Struggle.

(By Telegraph.)

Affairs at the Homestead Steel Works have reached a crisis. An attempt of the firm to send 300 Pinkerton detectives to guard their property has resulted in an encounter between these men and the locked out employees, with the result that a number of men have been killed and many injured. The first decisive move on the part of the firm was made on Tuesday, when a legal demand was made on the Sheriff of Allegheny County to protect the firm in their rights to control and operate the Homestead Steel Works. The application was made in legal form by H. C. Frick, chairman of the Carnegie Steel Company, Limited, and Carnegie, Phipps & Co., Limited, and was served on the Sheriff of Allegheny County on Monday, July 4. The document was prepared by the attorneys of the firm, and reads as follows:

PITTSBURGH, Pa., July 4, 1892.

To W. H. McCleary, Sheriff of Allegheny County, Pa.

DEAR SIR.—Will you please take notice that at and in the vicinity of our works in Mifflin Township, near Homestead, Allegheny County, Pa., and upon the highways leading thereto from all directions, bodies of men have collected who assume to and do prevent to our employees access to and egress from our property, and that from threats openly made we have reasonable cause to apprehend that an attempt will be made to collect a mob and to destroy or damage our property aforesaid, and to prevent us from its use and enjoyment. This property consists of mills, buildings, workshops, machinery and other personal property. We, therefore, call upon you, as Sheriff of Allegheny County, Pa., to protect our property from violence, damage and destruction, and to protect us in its free use and enjoyment.

(Signed)

THE CARNEGIE STEEL CO., LIMITED,
By H. C. Frick, Chairman.
CARNEGIE, PHIPPS & CO., LIMITED,
By H. C. Frick, Chairman.

Immediately after notice had been served upon the Sheriff, i.e., accompanied by two deputy sheriffs, went to Homestead and repaired to the headquarters of the strikers and announced to them that they would assume control of all the property of the Carnegie Steel Company, Limited, and would send deputies to guard the works. A request for a pass to visit the interior of the mill was granted by the Advisory Committee of the strikers, and a body guard of ten men was furnished the Sheriff in his tour of the mills. After making a thorough inspection of the plant the Sheriff was informed that if deputy sheriffs were brought to Homestead to guard the works the Advisory Committee of the strikers would at once be dissolved and they would not be held responsible for any trouble that would arise out of the coming of deputy sheriffs. The information that the Advisory Committee had been dissolved and that deputy sheriffs would be in Homestead in a short time to guard the works caused intense excitement, and in a short time a petition was in circulation among the leading merchants of Homestead asking that Robert

E. Pattison, Governor of Pennsylvania, visit Homestead immediately and take some steps toward avoiding trouble and possibly bloodshed, which would undoubtedly occur. Up to this time no reply has been received from the Governor. About 5 o'clock on the afternoon of Tuesday twelve deputy sheriffs from Pittsburgh arrived at the Homestead Steel Works, and were denied admission by the strikers, who had congregated at the large gates to the number of several thousand. The leader of the deputy sheriffs demanded entrance to the works, which was immediately refused by the leaders of the workmen. It was then decided that the deputy sheriffs should not force an entrance in the mill, but after consultation among themselves they returned to Pittsburgh. After the departure of the deputy sheriffs affairs at Homestead were calmed down to some extent, but there was an under feeling of intense excitement.

About 5 o'clock this morning two barges with 300 Pinkerton detectives on board arrived at the Homestead Steel Works, and in their attempt to enter the property were attacked by the strikers, who were armed, and several men were killed, including the captain of the boat and a number of the strikers, and many others were injured. Nearly all the fence surrounding the Homestead Steel Works was torn down by the strikers. At this writing intense excitement prevails. Two encounters between the Pinkerton detectives and the strikers have taken place. The attempt of the firm to introduce Pinkerton detectives into the works was for the reason that they desire to protect their employees who are making repairs to the plant. The excitement is not confined to Homestead alone, but also to Pittsburgh, and the various newspaper offices are crowded with people eagerly reading bulletins from Homestead, which are posted every few minutes.

(Later.)

No further conflict has taken place than the two noted above. An official list received a few minutes ago states that seven men were killed and 13 injured. The Amalgamated Association, through Mr. Weihe, president, sent a communication to the officials of the Carnegie Steel Company, Limited, asking that another conference be held to-day. This was emphatically refused by the firm, and we are informed by T. F. Lovejoy that no further conferences between the Carnegie Steel Company, Limited, and the Amalgamated Association will be held under any circumstances. The policy of the firm has been outlined, and it will not be deviated from under any conditions. The Homestead Steel Works have been placed in charge of the Sheriff of Allegheny County, and the firm looks to that official to preserve order and allow operations to be carried on at these works as may be desired by the firm. Any depredations committed against the property will have to be borne by the county, as the Sheriff has had the property in charge since yesterday. It is impossible to state

at this time what damage has been done to the plant, but it is positively known that the entire works were in the hands of a mob for some hours. Beam shapes and other material lying around the works has been taken by the mob and carried to the river bank, where an improvised fort has been erected, behind which the strikers have gathered, equipped with arms. Any attempts made by Pinkerton men to gain possession of the works will undoubtedly result in further bloodshed. Intense excitement prevails both in Pittsburgh and at Homestead, and a further outbreak may occur at any minute.

The Holcomb-Brown Iron Company of Burlington, Iowa, signed the Amalgamated Association scale yesterday.

(Still Later.)

Shortly after 2 o'clock another pitched battle between the Pinkerton detectives and mob at the Homestead Steel Works took place. It is reported that ten men were killed and about 15 injured, which will run the total of those killed up to about 25 and of those injured to about 40. The battle raged for half an hour or more, and firing has continued at intervals right along and is still going on. When hostilities commenced the supply of firearms and ammunition among the workmen was comparatively small. These have been largely increased, however, and it is safe to say that there are not less than 3000 armed men now in possession of the Homestead Steel Works, who have sworn to lay down their lives before they will give possession of the works to the Pinkerton detectives. The fact that nearly every iron mill in Pittsburgh and vicinity is idle has lent fuel to the flames, for the reason that hundreds of idle workmen have boarded trains and others are walking to the scene of the riot at Homestead. The ranks of the rioters are being increased very largely, and the situation is growing rapidly worse. The barges containing the Pinkerton detectives are anchored in the Monongahela River just below the works, and are subject to fire from the mob from both sides of the river. In some way the mob have secured possession of two cannons and these have been placed just inside the works and are being discharged at the boats on which the Pinkerton detectives are lodged as often as the ammunition can be secured to load them. There is no doubt but that fearful damage to the plant has been done, as the people are in such a frenzied condition that they are stopping at nothing. Rolls, beam shapes and any material whatever that can be removed has been taken to the river bank to help strengthen the fort which the rioters have built. All the loose scrap iron lying around the mills has been secured by the strikers and is being cut up and fired from the cannons in possession of the strikers. About an hour ago it was reported that the Pinkerton detectives had raised a white flag on their barge as a sign of truce, and as soon as it was shown it was shot down by the rioters. Threats are made that no Pinkerton man will be allowed to leave the scene of the conflict alive, and other threats are to the effect that before the rioters will allow

the mill to be operated by non union men they will burn it to the ground. Advice just received from Homestead state that a large supply of dynamite cartridges has been shipped there from Pittsburgh and are now being fired into the barges on which the Pinkerton detectives are lodged, and a determined effort will be made to blow them up. It is reported that the rioters will next turn their attention to the destruction of the mill and a complete wrecking of the Homestead Steel Works before the rioters have been put under control is probable. It is now reported that troops have been ordered out, as the local authorities are utterly unable to cope with the mob that is being increased in numbers every minute. Early this morning Sheriff McCleary telegraphed Governor Pattison of Pennsylvania as follows:

R. E. Pattison, Harrisburg:

Situation at Homestead very grave. My deputies were driven from the ground and watchmen sent by mill owners attacked. Shots were exchanged and some men were killed and wounded. Unless prompt means are taken to prevent it, further bloodshed and great destruction of property may be expected. The striking workmen and their friends on the ground number 5000, and the civil authorities are utterly unable to cope with them. Wish you would send instructions at once. (Signed), W. H. McCleary.

It was several hours before a reply was received, and when an answer came back the Governor stated that all possible means at the disposal of the sheriff must be exhausted before the State Militia would be called out. About 3 p.m. Sheriff McCleary again telegraphed the Governor that the local authorities were utterly unable to control the mob, and the aid of the State will have to be invoked to suppress the riot. It is probable that the State troops will be ordered out at once and sent to Homestead. After William Weihe, president of the Amalgamated Association, had failed in his attempt to secure another conference with the Carnegie Steel Company, Limited, he went to the Sheriff's office and was in consultation with Sheriff McCleary for some time. About 3:30 p.m. Sheriff McCleary and President Weihe boarded a train for Homestead. This has given rise to a rumor that upon his arrival there President Weihe will demand a cessation of hostilities, and will permit the Pinkerton detectives to gain possession of the works. Officials of the Carnegie Steel Company, Limited, while deploring the loss of life that has taken place at Homestead, absolutely decline to give out any statements to the public. They say that 24 hours ago their plant was placed in the hands of the Sheriff of Allegheny County, and this action relieved them of any responsibility whatever connected with the riots. Not since the famous railroad riots in 1877 has there been so much excitement in Pittsburgh as there is now over the conflicts that have taken place at Homestead. Hundreds of men, principally those who are employed in the mills, are gathered about the newspaper offices and street corner discussing the state of affairs at Homestead.

Threats are made that if the firm don't give in by to-night that an armed mob will go from Pittsburgh to Homestead and wipe the Homestead Steel Works from the face of the earth. Threats of violence have also been made against officials of the Carnegie Company, and it is impossible to accurately describe the feelings of the men who are now out on strike themselves and whose sympathy is naturally with the strikers at Homestead. Late dispatches from Homestead state that a large supply of firearms, consisting of repeating rifles and revolvers have just been sent from Pittsburgh to

Homestead for the use of the strikers. Hundreds of men are encamped on the hills on both sides of the river, and a commanding view of the spot where the boats are moored containing the Pinkerton detectives is thus secured. Sharpshooting is going on right along, and every time a form is seen on board the boat it is fired at. The Pinkerton detectives are completely surrounded and are unable to leave the scene of the conflict, and many more of them will, no doubt, be killed unless reinforcements are sent to their aid very soon. In some manner the mob have secured possession of a large number of barrels of oil, and have dumped their contents into the Monongahela River, a short distance above where the boats containing the Pinkerton detectives are lodged. The idea is to allow the oil to float down on the top of the water until it gets near the boats and igniting it, and thus burn up the boats containing the Pinkerton detectives. A report just received states that 3000 men fully armed have left Pittsburgh for Homestead to aid the mob. As night settles down over the scene of the conflict, it is expected that hostilities will be resumed, and there is no telling where the conflict will end. It is the general impression that unless State troops arrive at Homestead within the next three or four hours the Homestead Steel Works will be completely destroyed.

About 4:30 o'clock, President Weihe arrived in Homestead and immediately repaired to the headquarters of the Amalgamated Association and made an address to a crowd of the strikers, in which he advised the men to use every means in their power to stop the hostilities that are being carried on. His speech, however, had little effect, and he was compelled to stop on account of disorder. President Weihe then proceeded to the Homestead Steel Works and was accompanied by a large body of men. He endeavored to prevent firing on the boats and secured a promise from Sheriff McCleary that if the men would agree to stop firing that Sheriff McCleary would have the barges and the Pinkerton men removed from the scene. The men emphatically refused to accept this proposition and the firing has continued right along. At 5:20 o'clock the Pinkerton detectives, through their leader, surrendered to the mob, on condition that they be allowed to leave Homestead without injury. The mob agree to the surrender, and about six o'clock the Pinkerton detectives abandoned the boats and boarded trains for Pittsburgh. They were compelled, however, to leave their arms and all ammunition. It is now thought the action of the Pinkerton men in surrendering and leaving the scene will quiet down the rioters to some extent, although there is but little needed to create a further outbreak. The scenes enacted at Homestead to-day have never been equaled in Allegheny County, with the single exception of the time the railroad riots were in progress in July, 1877. The damage done will amount to hundreds of thousands of dollars, without counting the terrible loss of life. At this writing, 6:30 p.m., the mob have quieted down, and many have left the hillside and are going to their homes. It is believed that the advice of President Weihe to cease hostilities will be observed from this time on account of the removal of the Pinkerton detectives. Now that the Pinkerton men have been moved from the scene, it is not known at this writing what move the firm will make next. It is the general impression, however, that the works will be placed under the care of State troops, and the troops are expected to arrive at Homestead some time to-night, or early on Thursday morning. A careful estimate places the loss of life at 25 people, while about double that number were seriously injured.

HARDWARE.

Condition of Trade.

THE PAST WEEK, broken as it was by a holiday and in the midst of the summer dullness, was characterized by only a moderate volume of business, orders being reduced to a minimum. Many concerns, both manufacturing and mercantile, are giving attention to the closing of the half year's business and to the making of arrangements for the coming season. Vacations also, and the fact that travelers are nearly all at home, tend to diminish the volume of trade. Apart from these features, there is little new to report. It is rather early as yet to arrive at a definite conclusion as to the comparison of this year's business thus far with that of 1891, but the general impression is that notwithstanding the disappointment which has been experienced, the trade of the past season will slightly exceed that of last year. Prices remain unchanged except in a few comparatively unimportant lines, and the market as a whole does not show any increased strength. The next week or two, when trade will presumably be quiet, can be advantageously utilized by manufacturers and merchants in making their arrangements for the next few months, and getting everything in such shape as to permit the best use of the opportunities afforded in trade.

Chicago.

(By Telegraph.)

The prayer of the Hardware trade of the Northwest is for less rain and more sunshine. The heavy rains of the past week came at a time when trade was picking up nicely and the prospects favored a steady continuance. Since then business has suffered in consequence of a renewal of heavy rains and floods, and complaint is quite general about interference with business. On every hand the opinion is heard that if only pleasant weather could be had for a week or so the change toward an improvement would be speedy, and the effect would be excellent on the movement of all classes of goods. With this understanding the month of July is looked forward to as a month of very heavy trade.

St. Louis.

(By Telegraph.)

Considering the changeable weather which the West has experienced during the past week the volume of trade has been very satisfactory. A sudden falling off in the demand for hot-weather goods is noticeable, which, however, is only temporary, as the cool weather at present pre-

vailing will soon have to give way to a more seasonable kind. Outside work has been interfered with somewhat by the inclement weather, but notwithstanding this fact Builders' Tools and Materials are ordered freely. Prices do not show any particular change, and are, on the whole, fairly satisfactory.

St. Paul.

FARWELL, OZMUN, KIRK & Co.—Since our last trade has been quite satisfactory. We have now reached the time of year when it is active. There has been considerable improvement in sales, and jobbers in Hardware have had about all they could handle to advantage. The prospects are that trade for the next few weeks will be good, though the weather is not just as favorable as it might be. Rains are excessive, though the territory tributary to St. Paul has not suffered much from floods, still there has been an excess of rain, and the weather is also quite cool for the season. However, this has not done any great injury thus far, and if we have a little more favorable turn of weather for the next fortnight there will be a fine crop, as the grain is well rooted, and all that is needed is favorable weather for its maturing. Collections thus far are not as good as hoped for last fall, as that part of the '91 crop which was not threshed in the fall has been much injured by the unusual weather, and does not bring nearly so much money as it would have done last fall.

Cleveland.

THE W. BINGHAM COMPANY.—That the first half of 1892 has been a disappointment to many there is no doubt—not that trade has fallen short of a year ago, but that it has not come up to the expectation based last fall and winter upon the exceptionally large crops harvested all over the country. There are many causes for the failure to realize these expectations, chief among which is the great amount of wet weather which has prevailed throughout the land during the past spring, the instability of the market generally and the fact that the money received for the large crops has been used principally to clear up old debts. The latter fact has placed country merchants in much better shape financially than they have been for some time; therefore, the outlook for fall is encouraging. This being the Presidential year we do not think will be the bugbear it usually has been to trade in general, as both the candidates have been tried before and most people have made up their minds as to which one they will support.

Trade for June has been good, season goods especially being in large demand. Orders for Sheet Iron for fall have commenced to come in, and the probabilities are that stocks will run short later in the

season, as they usually have. Prices, therefore, are being held firm.

The attempt to advance prices on Wire Nails has been only partially successful, as all mills do not seem to be of the same mind on this subject. The mail order business was usually large, but with the coming season of outing general trade may be expected to fall off. Collections are fair.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—At this season of the year little in the way of orders from salesmen is being received, as most houses have recalled their representatives for their own vacation, also in order that they may allow those employed in the house to secure the advantage of the summer vacation, the custom of giving every one a two weeks' recreation having become almost universal with the jobbing trade in the large cities. It is also the time for prices to be gone over with the salesmen, necessary revisions made with each one, samples of spring and summer goods relegated to the job table and substitutions made in the travelers' trunks of fall and winter articles. As there has been practically only one working day since the closing of the first six months of the present year, an opportunity has not been offered in which to figure up the sales as compared with previous seasons, but in looking back over the time past and with comparisons of earlier months than June we can feel well satisfied with the trade we have been favored with and rest well assured that no backward step has been taken in volume at least. In the outlook for what is to come, notwithstanding the political discussions and possible turmoils that frequently exist during Presidential election seasons, we find by reports from most of the territory covered by Eastern houses that a very satisfactory feeling exists. While never a safe thing to count the product of the poultry yard in advance of hatching time, we feel pretty well assured that the outlook is for a continued siege of work.

Baltimore.

CARLIN & FULTON.—Just now, as is usual at this time of the year, business is generally quiet; the retail stores throughout the city feel the absence of so many who have gone to suburban homes in order to escape the extreme heat of the city, and besides building operations are somewhat interfered with locally by the differences between the contractors and their employees in regard to the length of a working day. The contemplated change of our entire street car system to cable and electric roads has made this a great market for such material as is needed in construction and immense sums of money are being distributed weekly for labor. Throughout the agricultural sections the

farmers are busy with their harvest and, therefore, have but little time to patronize the village stores, and as many of the latter take this opportunity to inventory their stocks, there is but little inclination to buy goods. From what we can learn the wheat crop throughout this section will be very satisfactory and should result in a good business during the fall, but it is too early as yet to make any safe predictions as to what may be done in the cotton States.

San Francisco.

HUNTINGTON - HOPKINS COMPANY.—Trade locally continues dull, while through the country it is fairly active. There is no stiffening up in the price of staples, Merchant Bar Iron and Barb Wire, being sold way down; all agreements which formerly existed are off, and the trade are selling entirely independent of each other. Wrought-Iron Pipe has also been forced down again, although we thought it had reached bottom before. Collections are beginning to show signs of improvement, and they will be better from now on.

Louisville.

W. B. BELKNAP & Co.—The weather for harvesting wheat has been so fine that all hands and the machine have been engaged in the field rather than elsewhere. The picturesque, bright golden stretches of landscape, thickly studded with shocks of ripe grain, are pleasing to the eye and suggestive of good times a-coming. Corn is a little late, but growing sturdily, owing to recent rains and heat, and tobacco is satisfactory, the main struggle being to keep down the weeds between the rows of both. While our agricultural community is so well employed we should not be disposed to grumble if by reason thereof the demand for certain goods is somewhat light. The wear and tear is going on the same and the demand must certainly come a little later with this new wealth. If we can only market the prospective grain product at anything like the rate we did last year we ought to be able to stop the export of gold or any other movement which is deemed unfavorable.

Money is in easy supply, although hereabouts and throughout the South generally it is in good demand and the banks are fairly well loaned up. What we want here and between this and the Gulf is a good price for cotton. That is the inspiration needed for Dixie. Iron and Iron products continue very low; even the scare of the general closing down for the first half of this month has not had a very terrifying effect upon the buyers. There has been no rush to cover, as there would have been in former years, when possible production was so much smaller. Now we feel that by putting the machinery to work demand of almost any magnitude may be soon satisfied. This is due largely to the substitution of Steel for Iron, doing away with the laborious and comparatively slow process of puddling. Politics so far are not cutting much, if any, figure in the situation, as both parties are committed to sound money (and certainly both candi-

dates for the Presidency are), and apprehension on that score has been largely allayed. It looks to us as though we were entering upon a period of prosperity, not all of which is to be attributed to the McKinley bill, much as the high protectionists would like to have us so believe.

Omaha.

LEE - CLARKE - ANDRESEN HARDWARE COMPANY.—The splendid growing weather experienced since our last report and the consequent improved crop prospects have made a corresponding improvement in all lines of trade. These favorable conditions have done more than to create a mere temporary improvement in business circles, they have produced a restoration of confidence which presages a more liberal movement of goods during the summer months. Good crops are always desirable, and with another abundant harvest Nebraska will be placed in an enviable position that will make her noteworthy as one of the most prosperous States in the Union. There is a large surplus of grain still remaining in the hands of producers, and this of itself is a sufficient guarantee to the country against any financial depression that might result from any ordinary loss in the chief crops this season. Trade is all that could be desired. Country merchants are buying freely and meeting their obligations promptly. The total amount of business transactions since our last report has been very large and away beyond anything anticipated. Omaha jobbers and manufacturers realize now as never before the importance and advantage to themselves of the home patronage movement. There is no limit to which this theory may not be worked in practice, and our wideawake merchants throughout the State are making special efforts to centralize their business in this advantageous manner.

Portland, Ore.

FOSTER & ROBERTSON.—Trade has shown a slight improvement since our last letter. Our crop prospects, however, are not so good and the chances are we will not have an average crop. Still, should everything be favorable from now on to harvest, the prospects may improve. The hot winds that prevailed along the Columbia River some three weeks since have burned up the crops of that section, and the hot weather of the past week has done considerable damage in other sections. In other localities the outlook is still good, and unless there should be damage from hot weather or winds they may make up for the shortage in other places. Collections are fair, considering the hard times complained of in this section. The only change to note in prices is a decline of 1 cent per pound on Sisal Rope, making it 10 cents now, and a revised price for Nails: Cut Steel, \$2.50 base, and \$2.35 in carload; Wire, \$2.65 base, and \$2.55 in carload.

WILLIAM R. GRAEF of Graef & Schmidt, 29 Warren street, New York, sailed for Europe on Tuesday, July 5.

Notes on Prices.

Cut Nails.—The market for Cut Nails is quiet, inquiries being few and the manufacturers not disposed to press sales. They are, in fact, pursuing a conservative policy, and are unwilling to quote on large lots for future delivery. Prices are as they have been for the past few weeks. In the West \$1.50 at mill on a 25-cent average is a fair quotation, though it is sometimes shaded on desirable lots. The prices in the East are fairly well maintained on a basis of \$1.55 at mill for Steel Nails on a 30-cent. average, with equalization of freight. Iron Nails, 3 cents a keg less, and on lots of 1000 kegs an abatement of 5 cents a keg is made. In our last issue it was incorrectly stated that this abatement of 5 cents is made on carload lots. It should have been on 1000 keg lots, as above.

Chicago, by Telegraph.—The supply of Cut Nails is now very short, particularly in the leading sizes. Very few factories are in operation and manufacturers are only selling from stock on hand and are not disposed to take orders for future delivery. They are making no advance on such shipments as they can make from stock, but quote \$1.57½ to \$1.60, Chicago, on a 30-cent average. Jobbers ask \$1.70 from stock and are quite firm in this quotation, in view of the scarcity of leading sizes.

Wire Nails.—The slightly improved condition referred to in our last report still continues, and while there has been a reaction from the extreme prices made within the past few weeks, the market is still irregular. More of the mills are holding to \$1.60, f.o.b. mill, and refusing to make lower quotations. This figure is, however, shaded by other manufacturers, and \$1.55 is still obtainable. The market on the whole is thus in a better condition, and manufacturers are conferring with a view to a still better understanding and a possible advance in prices. Small lots from store in New York are held at \$1.85.

Chicago, by Telegraph.—The manufacturers of Wire Nails expect to have a meeting very shortly and they are endeavoring to create the impression that prices will be advanced immediately. There is some faith in the advance in view of the stoppage of the Western rolling mills and the closing down of numerous Nail factories. The large buyers are not making inquiries just now of manufacturers, being pretty well supplied with stock. Jobbers have advanced their prices, in sympathy with the recent advance made by manufacturers, and now quote in a regular way \$1.75 from stock. The general price asked by manufacturers is \$1.70, Chicago.

Barb Wire.—The market for Barb Wire is, as usual at this season, inactive, and prices, while on the whole well maintained, are a shade weaker. The general quotation for Galvanized Four Point at mill continues \$2.62½ @ \$2.65. Small lots from store in New York are held at \$3.10, an abatement of 10 cents being made in carloads.

Chicago, by Telegraph.—The demand for Barb Wire is very light just now, both from manufacturers and from jobbers. Manufacturers are reported to have weak-

ened a trifle, and it is quite possible that Painted could now be had at \$2.30 for shipment from factory. Jobbers are quoting small lots at \$2.40 for Painted and \$2.85 @ \$2.90 for Galvanized.

Strap and T Hinges.—In view of the irregularities in the market to which we referred in our last issue, the manufacturers at their meeting on Thursday reduced the price, making the discount 50 and 10 and 5 per cent.

Wringers.—Under date July 1 the American Wringer Company, 99 Chambers street, New York, issue a revised price-list of their extensive line of Wringers. The list prices, with a few unimportant exceptions, remain unchanged, and are subject to a discount of 2 per cent. for cash in ten days. A quantity discount of 10 per cent. is made on 5 dozen lots assorted. Two new lines of Wringers have been added, the A. W. Company Wringer with iron frame and the Imperial with wood frame, the list prices of which are as follows:

The A. W. Company Wringer, Iron Frame, Steel Springs and Straight Tie Rod.

	Size of roll.	
	Length. Inches.	Diameter. Inches.
		Per doz.
No. 2, small family size.....	10	1 1/4 \$18
No. 3, medium family size.....	11	1 1/2 22
No. 4, large family size.....	12	1 3/4 27
No. 2, small family size.....	10	1 1/4 19
No. 3, medium family size.....	11	1 1/2 23
No. 4, large family size.....	12	1 3/4 28
No. 5, small hotel size.....	14	1 1/2 37
No. 6, large hotel size.....	16	2 46

The Imperial Wringer, Wood Frame, Two Pressure Screws and Cog Wheels.

No. XX2 1/2, small family size...	10	1 1/4 \$22
No. XX1 1/2, medium family size...	11	1 1/2 27
No. XX1 1/4, large family size...	12	1 3/4 32

Powder.—Under date July 1 reduced prices on Powder are announced by the manufacturers, the change being understood to be on account of active competition. The new prices are represented in the lists printed below.

Lafin & Rand Powder Company, 27 Murray street, New York, issue the following prices, terms 60 days, or 2 per cent. discount for cash in ten days:

Keg Powder.

Orange Rifle, Extra, kegs, 25 pounds...	\$5.00
" " " " " 12 1/2 " "	2.75
" " " " " 6 1/2 " "	1.50
Orange Special, " 25 " "	6.00
" " " " " 12 1/2 " "	3.25
" " " " " 6 1/2 " "	1.75
Creedmoor, " 6 1/2 " "	1.50
Orange Ducking ("Gold Band"), kegs, 6 1/2 pounds.....	3.00
Meal and Dust, kegs, 25 pounds.....	5.00
Blasting and Mining (B), kegs, 25 pounds.....	1.50
Blasting and Mining (A), kegs, 25 pounds.....	2.00

Canister Powder.

Orange Lightning, canisters, 1 pound...	\$0.90
" Ducking, " 1 " "	.60
" Rifle, Extra, " 1 " "	.30
" " " " 1/2 " "	.18
" " " " 1/4 " "	.13

The Hazard Powder Company, 63 Pine street, New York, issue the new prices in

the form given below. They also announce in regard to Rifle and Sporting Powder that for lots of 1000 pounds or over, one sale, one shipment, and to one consignee, a discount of 9 per cent. will be allowed. For any less quantity here is no discount. The prices quoted for Blasting and Shipping Powder are net. Terms f.o.b. New York City, subject to a discount of 2 per cent. for cash in ten days.

Canister Powder.

Electric, Nos. 1, 2, 3, 4, 5, 6 and 7 grain, in square canisters of 1 pound each....	\$ 0.90
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in oval canisters of 1 pound each.....	.60
Kentucky Rifle, FFFg, FFG and "Sea Shooting" FG, in oval canisters of 1 pound each.....	.30
Kentucky Rifle, FFFg, FFG and "Sea Shooting" FG, in oval canisters of 1/2 pound each.....	.18

Keg Powder.

Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in kegs, 25 pounds each.....	11.00
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in kegs, 12 1/2 pounds each.....	5.75
Duck Shooting, Nos. 1, 2, 3, 4, 5 and 6 grain, in kegs, 6 1/2 pounds each.....	3.00
Kentucky Rifle, FFFg, FFG and "Sea Shooting" FG, in kegs, 25 pounds each.....	5.00
Kentucky Rifle, coarser grains FG duck size and FG duck size, No. 1, in kegs, 25 pounds each.....	5.00
Kentucky Rifle, coarser grains FG duck size and FG duck size, No. 1, in kegs, 12 1/2 pounds each.....	2.75
Kentucky Rifle, coarser grains FG duck size and FG duck size, No. 1, in kegs, 6 1/2 pounds each.....	1.50
Trap Powder, Nos. 1, 2 and 3 for club shooting, in kegs, 25 pounds each.....	6.00
Trap Powder, Nos. 1, 2 and 3 for club shooting, in kegs, 12 1/2 pounds each.....	3.25
Trap Powder, Nos. 1, 2 and 3 for club shooting, in kegs, 6 1/2 pounds each.....	1.75
Meal Powder, in kegs, 25 pounds each.....	4.50
Shipping Powder, FFF, FF, F, C, CC, and CCC, in kegs, 25 pounds each.....	2.00
Mining and Blasting Powder, FFF, FF, F, C, CC and CCC, in kegs, 25 pounds each.....	1.50

The following are the prices of American Powder Mills, Chicago, f.o.b. Chicago or St. Louis:

Sporting Powder.

Kegs of 25 pounds, net single package....	\$5.00
" 12 1/2 " " " " " " " " " " " "	2.75
" 6 1/2 " " " " " " " " " " " "	1.50
Case, 24 1-pound cans.....	7.20
" 24 1/2 " " " " " " " " " " " "	4.32

Rifle Cartridge.

Kegs of 25 pounds net.....	\$6.00
" 6 1/2 " " " " " " " " " " " "	1.75

Duckling.

Kegs of 12 1/2 pounds.....	\$5.75
" 6 1/2 " " " " " " " " " " " "	3.00
Cases, 24 1-pound cans.....	14 00

Special discount on lots of 1000 pounds.

Blasting Powder.

Kegs of 25 pounds, less than 400 kegs.....	\$1.50
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The Walling Shutter Bower.—This article, which is manufactured by the Walling Patent Shutter Bower Company, Frederick, Md., is sold from the following list at a discount of 45 per cent.:

Japanned, Per Dozen Sets.

Inches.....	9	10 1/2	12	14	16	18
	\$4.50	5.00	5.50	6.50	7.00	7.50

Galvanized, Per Dozen Sets.

Inches.....	9	10 1/2	12	14	16	18
	\$6.00	6.50	7.00	7.75	8.50	9.00

Glass.—There are no new developments in the Glass market, and business among jobbers and importers is quiet. Most of the travelers have been called in, as the orders taken do not pay expenses. Reports from American factories state that stocks are light on salable sizes, while there is an abundance of small sizes.

While there is little or no business being done there is no weakness reported in the market, but a strong endeavor on the part of jobbers to keep prices firm, and an anticipation of a good fall trade. The factories have closed down, and the interesting question is, When they will start up? Nominal quotations remain unchanged and are as follows: American Window Glass, 1000-box lots or more, 80, 10 and 5 per cent. discount; carloads, 80 and 10 per cent. discount; less than carloads, 80 and 5 per cent. discount; French Window Glass, 80 and 5 per cent. discount; American Plate is held at a discount of 50, 10 and 5 per cent., and imported Plate at a discount of 60 per cent.

Export Notes.

BUSINESS with the west coast of South America continues to increase, and among the goods being sent are quantities of Coffee Mills, which have usually been supplied by the French, Disston Saws, Cotton Line, Jail Padlocks, Shovels, Picks, Sledges, Hammers, Furniture Trim-mings, &c.

We note a considerable amount of Agricultural Implements for Buenos Ayres and the River Plate country going forward. That section seems to have seen the worst of its difficulties, and an improvement is going on.

Trade with Venezuela, owing to the recent disturbances in that country, is quiet, and has not been re established on a satisfactory basis.

The last clause in the reciprocity treaty with Spain concerning Cuba went into effect July 1, and while some of the merchants anticipate a larger trade in July, they are in doubt about the future, for while it is true some of the duties have been reduced, the number of articles which must still go from Spain has been increased.

Mexican trade is not as large in volume as could be desired, on account of the high rate of exchange consequent on the depreciation in silver.

Australia and New Zealand are still suffering from the collapse of land speculations, and are contracting their credits, simply supplying themselves with necessities and such goods as are required to complete assortments.

Thomas A. Eddy of the Coombs, Crosby & Eddy Company, 78 South street, New York, who left here May 2 for Argentine and the River Plate country, via London and Paris, was due there June 25. The object of his trip is the extension of their business to that section.

D. L. Stevens of W. R. Grace & Co., Hanover Square, New York, is back from an extended trip along the west coast of South America, where he has been for some time opening up new business and increasing that already established by this

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(From a Special Correspondent.)

MIDSUMMER quiet prevails in the Hardware trade in this city. Very little pushing work is being done by the jobbers, as most all the traveling salesmen are either helping to take stock or are on their vacation. More attention is now paid to balancing accounts, calling in collections and formulating a basis for another 12 months' work than to making new sales. On all sides merchants and manufacturers are possessed with the idea that the worst is over as regards dull trade, and that the coming six months are full of promise for all classes of business. Providing prices have indeed reached bottom, the needs of the country will naturally cause a large volume of general business, and if jobbers could believe that they would be protected in their deals they would be ready enough to buy heavily and lay in large stocks, well knowing their ability to carry and distribute them. If the growing crops prove as heavy as they promise the railroads will have need of all the cars recently contracted for, although the present freight offering is light and will continue so for quite a while. The low prices caused by the big cotton crop and subsequent devastation by the floods have curtailed the Hardware line of business in this belt of country to a tremendous extent and our jobbers are doing very little through that region. It is very remarkable that so few failures are reported in a country where actual cash money is a scarce article among the producers and consumers. The Hardware trade through the country is, perhaps more than any other, on a cash basis, and for this reason is in a good condition. In the eastern part of Kentucky among the mountains there promises a considerable waking up in the Coal business. This development is being pushed quietly by a recent influx of foreign capital, which seems to have waited for just such lethargic times to gain advantageous footholds. The geological surveys of this State have brought to light vast deposits of Coal and Iron and other minerals, besides the finest timber in the world.

Price-Lists, Circulars, &c.

MICHIGAN WIRE & IRON WORKS, Detroit, Mich.: Wire Cloth, Wrought Iron Fencing, Iron Jail Cells, Iron Beds, &c. The catalogue is a neat and convenient one, bound in cloth, and is very complete in price lists, valuable tabulated matter and illustrations. Special attention is given to the manufacture of Mining Wire Cloth, Iron, Steel, Brass and Copper of all kinds, for ore screening in battery, jig and concentrator work. For this purpose steam looms, especially adapted for weaving these heavy grades, have been constructed.

C. F. GUYON COMPANY, 99 Reade street, New York, sole agents for M. Einwachter, Newark, N. J.: Mechanics' Tools, Tracing Wheels, Curling Tongs, Foster's Door Springs and other Hardware specialties. The catalogue illustrates a line of Nail Sets, Screw-Drivers, Counter Sinks, Pinking Irons, Rivet Sets, Conductor Punches, Can Openers, Screw Drivers, Auger Bits, &c., and is accompanied by a discount sheet. A large stock of these goods is constantly carried by the C. F. Guyon Company.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio: A budget of circulars referring to their Children's Vehicles, Gendron Cycles, Toy Wagons, Doll Cabs, Reed Furniture and Bamboo Novelties, &c.

HOWE BROS. & HULBERT, West Winsted, Conn.: Corkscrews, Shears and Solid Forged Steel Scissors and specialties. A catalogue devoted to Cork Screws shows these goods in a large variety of styles and sizes, the goods being referred to as having attained a high reputation in the market. Attention is called to their line of Solid Forged Steel Scissors, which are recommended and warranted by them as fully equal to any imported goods sold at the same price.

THE STANLEY RULE & LEVEL COMPANY, New Britain, Conn.: A page for insertion in their 1892 catalogue, illustrating and describing Stanley's Hand-y Plumbs and Levels and Hand-y Masons' Plumbs and Levels.

THE TEA TRAY COMPANY, Newark, N. J.: Japanned Tea Trays, Children's Trays, Crumb Pans and Brushes, of all kinds of metals; Brass Trays, Hotel Trays all extra japanned; also metal specialties, stamping, &c., of Silver, Brass, Sheet Iron and Tin; and manufacturers of Reflectors, Shades, Hoods, &c., for Electric Lighting; Horns, Typewriting Covers, and other articles of any shape or size made from drawings.

KENTUCKY WAGON MFG. COMPANY, Louisville, Ky.: Old Hickory and American Wagons, Carts, Drays, and other Vehicles. Illustrations and descriptions of these goods are given, together with views of the various departments in their new works and a view of their plant.

THE GOODSSELL PACKING COMPANY, Chicago, Ill.: Goodsell's Packings, Mill and Mining Supplies. Goodsell's Rubber-Black Flax Piston and Piston-Rod Packing, Hecla Sheet Packing, Removable Gaskets, Wire Insertion Gaskets, Rubber Valves, Swain Metallic Piston-Rod Packing, Rubber Belting, Rubber Hose, Leather Belting, &c.

JOHN S. FRAY & Co., Bridgeport, Conn.: Spofford, Ratchet, Sleeve and Drill Bit Braces, Hollow Handle Awl and Tool Sets, &c. They have recently added a 17-inch sweep Brace to their line of Spofford Braces, also a Ratchet Brace with Breast Drill Attachment. Their catalogue shows a large line of the above goods with prices.

STEWART & ROMAINE MFG. COMPANY, Philadelphia, Pa.: Romaine Expansion Bolts and Specialties in Wrought Iron. Illustrations are given of Expansive Bolts with round, square and slotted heads, Hooks and Bolts, Jamb Screws, Gas Pipe Hooks, Wall Hooks, Stirrups or Timber

Hangers, &c. These are designed for use by engineers, electric street railroads, electric companies, Hardware dealers, carpenters, plumbers, steam heating companies, railing manufacturers and workmen in iron.

THE WIRE GOODS COMPANY, Worcester, Mass.: Discount sheet No. 8, June, 1892. These discounts apply to the company's catalogue, December, 1888. The quotations given are net cash, it being explained that they make no cash discount. The large variety of the articles manufactured by the company is indicated in these quotations, which occupy six closely printed pages.

It is Reported—

That Sinclair Bros., Hardware dealers, Waterloo, Ind., have dissolved partnership.

That F. C. Williams, dealer in Hardware, Anthon, Iowa, has sold out.

That L. B. Chapel, Hardware merchant, Baldwin, Mich., has disposed of his business.

That the estate of W. F. Powers have sold out the Hardware stock at Hastings, Mich.

That Joseph Severa, Kent, Neb., has sold out his Hardware business to W. H. Riddle.

That Corbett & Reese, Hardware merchants Birmingham, Ala., have sold out their business.

That Isaac Boddy, Cherokee, Iowa, has sold out his Hardware stock.

That Sloan & Auger, Hardware dealers, at Hartwick, N. Y., have been succeeded by G. M. Auger.

That Tahrenhorst & Grothaus Bros., Celina, Ohio, have sold out their Hardware stock.

That the Hardware stock of the estate of K. M. Hutchinson, Oshkosh, Wis., is being closed out.

That the Hardware store of Salmar & Iverson, Vermillion, S. D., was broken into by burglars on the 22d ult., and \$150 worth of Knives and Revolvers taken.

That the annual meeting of the stockholders of the Langstaff Hardware Company, Memphis, Tenn., was held on the 21st ult. The former officers and board of directors were re-elected, H. P. Rodgers being added to the board. By a unanimous vote the stockholders expressed their complete satisfaction with the management of the business for the past year. The company are buying stock for their new store, in which they expect to resume business about August 1.

That Bridge & Brothers' Hardware store at Huntington, Ind., is to be greatly improved. A wing 11 x 36 feet will be built, leading south from the rear. It will be 24 feet high and built of stone, brick and iron, with skylights in the roof. The business facilities of the establishment will be thus greatly improved.

That J. B. Hecks has opened a Hardware store at Petersburg, Neb.

Exports.

PER SHIP ROMANOFF, JUNE 23, 1892, FOR NEWCASTLE.

By the Coombs, Crosby & Eddy Company.—3 cases Handles, 1 case Casters, 1 case Bird Cases, 1 case Pumps, 2 cases Axes, 1 bundle Rakes, 1 bundle Shovel Handles, 1 case Spades, 1 case Shovels, 1 case Mouse Traps, 1 case Hardware, 4 crates Churns, 3 crates Handles, 3 cases Steel Axes.

By W. H. Crossman & Bro.—3 cases Axes, 3 cases Handles, 2 cases Tacks, 3 cases Scale Beams, 1 case Brushes, 40 packages Hardware.

PER BARK SARANAC, JUNE 24, 1892, FOR FREE MANTLE, AUSTRALIA.

By Mailler & Quereau.—1 case Lawn Sprinklers, 3 cases Windmills, 1 case Pumps.

By Bradley & Hubbard Mfg. Company.—5 packages Lamp Goods.

By Winchester Repeating Arms Company.—2 cases Guns, 1 case Primers, 3 cases Guns, 38 cases Cartridges, 1 case Shells.

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LOUISVILLE.

(From a Special Correspondent.)

MIDSUMMER quiet prevails in the Hardware trade in this city. Very little pushing work is being done by the jobbers, as most all the traveling salesmen are either helping to take stock or are on their vacation. More attention is now paid to balancing accounts, calling in collections and formulating a basis for another 12 months' work than to making new sales. On all sides merchants and manufacturers are possessed with the idea that the worst is over as regards dull trade, and that the coming six months are full of promise for all classes of business. Providing prices have indeed reached bottom, the needs of the country will naturally cause a large volume of general business, and if jobbers could believe that they would be protected in their deals they would be ready enough to buy heavily and lay in large stocks, well knowing their ability to carry and distribute them. If the growing crops prove as heavy as they promise the railroads will have need of all the cars recently contracted for, although the present freight offering is light and will continue so for quite a while. The low prices caused by the big cotton crop and subsequent devastation by the floods have curtailed the Hardware line of business in this belt of country to a tremendous extent and our jobbers are doing very little through that region. It is very remarkable that so few failures are reported in a country where actual cash money is a scarce article among the producers and consumers. The Hardware trade through the country is, perhaps more than any other, on a cash basis, and for this reason is in a good condition. In the eastern part of Kentucky among the mountains there promises a considerable waking up in the Coal business. This development is being pushed quietly by a recent influx of foreign capital, which seems to have waited for just such lethargic times to gain advantageous footholds. The geological surveys of this State have brought to light vast deposits of Coal and Iron and other minerals, besides the finest timber in the world.

Price-Lists, Circulars, &c.

MICHIGAN WIRE & IRON WORKS, Detroit, Mich.: Wire Cloth, Wrought-Iron Fencing, Iron Jail Cells, Iron Beds, &c. The catalogue is a neat and convenient one, bound in cloth, and is very complete in price lists, valuable tabulated matter and illustrations. Special attention is given to the manufacture of Mining Wire Cloth, Iron, Steel, Brass and Copper of all kinds, for ore screening in battery, jig and concentrator work. For this purpose steam looms, especially adapted for weaving these heavy grades, have been constructed.

C. F. GUYON COMPANY, 99 Reade street, New York, sole agents for M. Einwachter, Newark, N. J.: Mechanics' Tools, Tracing Wheels, Curling Tongs, Foster's Door Springs and other Hardware specialties. The catalogue illustrates a line of Nail Sets, Screw-Driver Bits, Counter Sinks, Pinking Irons, Rivet Sets, Conductor Punches, Can Openers, Screw Drivers, Auger Bits, &c., and is accompanied by a discount sheet. A large stock of these goods is constantly carried by the C. F. Guyon Company.

GENDRON IRON WHEEL COMPANY, Toledo, Ohio: A budget of circulars referring to their Children's Vehicles, Gendron Cycles, Toy Wagons, Doll Cabs, Reed Furniture and Bamboo Novelties, &c.

HOWE BROS. & HULBERT, West Winsted, Conn.: Corkscrews, Shears and Solid Forged Steel Scissors and specialties. A catalogue devoted to Cork Screws shows these goods in a large variety of styles and sizes, the goods being referred to as having attained a high reputation in the market. Attention is called to their line of Solid Forged Steel Scissors, which are recommended and warranted by them as fully equal to any imported goods sold at the same price.

THE STANLEY RULE & LEVEL COMPANY, New Britain, Conn.: A page for insertion in their 1892 catalogue, illustrating and describing Stanley's Handy Plumbs and Levels and Handy Masons' Plumbs and Levels.

THE TEA TRAY COMPANY, Newark, N. J.: Japanned Tea Trays, Children's Trays, Crumb Pans and Brushes, of all kinds of metals; Brass Trays, Hotel Trays all extra japanned; also metal specialties, stamping, &c., of Silver, Brass, Sheet Iron and Tin; and manufacturers of Reflectors, Shades, Hoods, &c., for Electric Lighting; Horns, Typewriting Covers, and other articles of any shape or size made from drawings.

KENTUCKY WAGON MFG. COMPANY, Louisville, Ky.: Old Hickory and American Wagons, Carts, Drays, and other Vehicles. Illustrations and descriptions of these goods are given, together with views of the various departments in their new works and a view of their plant.

THE GOODSSELL PACKING COMPANY, Chicago, Ill.: Goodsell's Packings, Mill and Mining Supplies. Goodsell's Rubber-Black Flax Piston and Piston-Rod Packing, Hecla Sheet Packing, Removable Gaskets, Wire Insertion Gaskets, Rubber Valves, Swain Metallic Piston-Rod Packing, Rubber Belting, Rubber Hose, Leather Belting, &c.

JOHN S. FRAY & Co., Bridgeport, Conn.: Spofford, Ratchet, Sleeve and Drill Bit Braces, Hollow Handle Awl and Tool Sets, &c. They have recently added a 17-inch sweep Brace to their line of Spofford Braces, also a Ratchet Brace with Breast Drill Attachment. Their catalogue shows a large line of the above goods with prices.

STEWART & ROMAINE MFG. COMPANY, Philadelphia, Pa.: Romaine Expansion Bolts and Specialties in Wrought Iron. Illustrations are given of Expansive Bolts with round, square and slotted heads, Hooks and Bolts, Jamb Screws, Gas Pipe Hooks, Wall Hooks, Stirrups or Timber

Hangers, &c. These are designed for use by engineers, electric street railroads, electric companies, Hardware dealers, carpenters, plumbers, steam heating companies, railing manufacturers and workers in iron.

THE WIRE GOODS COMPANY, Worcester, Mass.: Discount sheet No. 8, June, 1892. These discounts apply to the company's catalogue, December, 1888. The quotations given are net cash, it being explained that they make no cash discount. The large variety of the articles manufactured by the company is indicated in these quotations, which occupy six closely printed pages.

It is Reported—

That Sinclair Bros., Hardware dealers, Waterloo, Ind., have dissolved partnership.

That F. C. Williams, dealer in Hardware, Anthon, Iowa, has sold out.

That L. B. Chapel, Hardware merchant, Baldwin, Mich., has disposed of his business.

That the estate of W. F. Powers have sold out the Hardware stock at Hastings, Mich.

That Joseph Severa, Kent, Neb., has sold out his Hardware business to W. H. Riddle.

That Corbett & Reese, Hardware merchants Birmingham, Ala., have sold out their business.

That Isaac Boddy, Cherokee, Iowa, has sold out his Hardware stock.

That Sloan & Auger, Hardware dealers, at Hartwick, N. Y., have been succeeded by G. M. Auger.

That Tahrenhorst & Grothaus Bros., Celina, Ohio, have sold out their Hardware stock.

That the Hardware stock of the estate of K. M. Hutchinson, Oshkosh, Wis., is being closed out.

That the Hardware store of Salmar & Iverson, Vermillion, S. D., was broken into by burglars on the 22d ult., and \$150 worth of Knives and Revolvers taken.

That the annual meeting of the stockholders of the Langstaff Hardware Company, Memphis, Tenn., was held on the 21st ult. The former officers and board of directors were re-elected, H. P. Rodgers being added to the board. By a unanimous vote the stockholders expressed their complete satisfaction with the management of the business for the past year. The company are buying stock for their new store, in which they expect to resume business about August 1.

That Bridge & Brothers' Hardware store at Huntington, Ind., is to be greatly improved. A wing 11 x 36 feet will be built, leading south from the rear. It will be 24 feet high and built of stone, brick and iron, with skylights in the roof. The business facilities of the establishment will be thus greatly improved.

That J. B. Hecks has opened a Hardware store at Petersburg, Neb.

Exports.

PER SHIP ROMANOFF, JUNE 23, 1892, FOR NEWCASTLE.

By the Coombs, Crosby & Eddy Company.—3 cases Handles, 1 case Casters, 1 case Bird Cases, 1 case Pumps, 2 cases Axes, 1 bundle Rakes, 1 bundle Shovel Handles, 1 case Spades, 1 case Shovels, 1 case Mouse Traps, 1 case Hardware, 4 crates Churns, 3 crates Handles, 3 cases Steel Axes.

By W. H. Crossman & Bro.—3 cases Axes, 3 cases Handles, 2 cases Tacks, 3 cases Scale Beams, 1 case Brushes, 40 packages Hardware.

PER BARK SARANAC, JUNE 24, 1892, FOR FREE MANTLE, AUSTRALIA.

By Mailler & Quereau.—1 case Lawn Sprinklers, 3 cases Windmills, 1 case Pumps.

By Brodley & Hubbard Mfg. Company.—5 packages Lamp Goods.

By Winchester Repeating Arms Company.—2 cases Guns, 1 case Primers, 3 cases Guns, 38 cases Cartridges, 1 case Shells.

By R. W. Forbes & Son.—2 cases Shovels, 2 cases Handles, 1 case Forks, 35 boxes Axes and Picks, 5 packages Hardware.

By Strong & Trowbridge.—4 cases Axes, 1 case Springs, 2 cases Bolts, 1 case Springs.

By H. W. Peabody & Co.—1 case Agricultural Implements, 8 packages Hardware, 10 kegs Nails, 18 packages Hardware, 2 cases Pumps, 3 crates Churns, 1 case Shovels, 26 packages Hardware, 1 package Razor Strops, 1 case Freezers, 1 case Shovels, 4 bundles Handles, 5 packages Lawn Mowers, 1 case Pumps, 7 cases Hardware, 1 case Pumps, 48 packages Hardware, 13 cases Cartridges, 1 box Thermometers, 4 cases Nails, 3 cases Wringers, 1 case Plated Ware, 7 cases Handles, 4 cases Axes, 11 cases Edge Tools, 1 case and 5 packages Handles, 6 cases Tools, 3 packages Hardware, 4 cases Wringers, 32 packages Hardware, 1 case Mouse Traps, 1 case Handles, 2 packages Lamp Goods, 1 case Carpet Sweepers, 10 packages Hardware, 2 cases Nails, 7 packages Lampware, 1 case Plated Ware, 3 packages Hardware, 7 packages Windmills, &c., 2 cases Guns, 14 cases Cartridges, 1 case Guns, 2 cases Pumps, 1 case Revolvers.

FOR LAUNCESTON.

By Coombs, Crosby & Eddy Company.—12 cases Nails, 1 case Hardware.

By H. W. Peabody & Co.—1 case Sandpaper, 2 cases Bolts.

By E. T. Hopkins.—3 cases Lawn Mowers.

By Walter A. Wood Mowing and Reaping Machine Company.—30 Harvesters and Binders, 30 Transports, 18 packages Carriers.

By Strong & Trowbridge.—62 crates Fiber Ware, 3 cases Tools, 2 cases Hardware, 1 case Cutlery, 2 cases Plated Ware, 10 cases Axes, 11 cases Agricultural Implements, 7 cases Meat Choppers, 48 cases Fruit Jars, 8 racks Churns, 7 cases Lampware, 1 case Traps, 2 cases Plated Ware, 2 cases Locks, 1 case Hay Knives, 1 case Hammers, 7 packages Pumps, 5 cases Nails, 1 case Traps, 1 case Brushes, 1 case Mills, 56 cases Axes, 1 barrel Hoes, 2 cases Door Springs, 3 cases Door Checks, 139 cases Axes, 7 cases Shovels, 30 kegs Nails, 184 cases Handles, 10 cases Axes, 1 case Brackets, 6 crates Tills, 1 case Auger Bits, 1 case Wire Goods, 12 cases Plows, 1 case Razor Strops, 1 case Nails, 3 cases Forks, 6 Windmills, 1 case Handles, 400 coils Barb Wire, 2 cases Hardware, 1 bundle Whips, 4 cases Wringers, 1 case Wire, 1 crate Brush Holders, 1 case Whips, 1 case Hardware, 1 case Iron Hinges, 1 case Hardware, 3 cases Lawn Mowers, 2 cases Hardware, 4 packages Scales, 10 kegs and 2 boxes Nails, 1 case Cotton Lines, 4 cases Whetstones, 1 case Hardware, 7 packages Stepladders, 9 crates Handles, 2 cases Hardware, 1 case Stencils, 11 packages Hardware, 2 cases Cartridges, 11 cases Lawn Mowers, 1 box Handles, 6 cases Hoes and Forks, 9 cases Saws, 8 cases Hardware, 100 reels Barb Wire, 1 case Locks, 1 case Wagon Jacks, 7 cases Lampware.

Paints and Colors.

It should be understood that the prices quoted in this column are strictly those current in the wholesale market, and that higher prices are paid for retail lots. The quality of goods frequently necessitates a considerable range of prices.

In the Paint trade there have been no distinctly new developments during the past week. As customary at the turn of the year, buyers' operations have slackened off more or less, leaving a spiritless condition of affairs in nearly all departments, yet it would appear from the statements of manufacturers and jobbers that there is no marked contrast with the average distribution for the season. In the position of the markets for base materials nothing has developed that would tend to cause any uneasiness. To the contrary, a turn for the better is noted in the only late weak spot, namely, Pig Lead, and the prospects are therefore encouraging for a steady market for the leading lines of Paints and Colors during the balance of the summer season.

Rumor has been busy with the affairs of certain leading firms, having it down as almost a certainty that the business of C. T. Reynolds & Co. and F. W. Devoe & Co. is about to be consolidated and going so far as to make it appear that a combination of those two firms and of Masury & Co. and Harrison Bros. is in

contemplation. Inquiry at the offices of the respective firms elicited positive denial of any such combination being seriously contemplated and the rumor evidently emanates from the efforts of energetic "promoters" who, for a period of 18 months or more, have been employing their peculiar talents to effect a deal of some sort. The respective firms will doubtless continue in the business on the same lines as heretofore.

White Lead.—An upward turn in price of crude material that has taken place during the past week or ten days imparts better tone to the market for White Lead, serving as it does to allay apprehension of a reduction in prices being made by the National Lead Company. To this extent the conditions are somewhat changed, but in other particulars the market is entirely bare of new feature. As between corrodors' product and that of manufacturers of Mixed Leads, there is no marked change in the consumption. Each is doing fairly well, with deliveries up to full average for the season and prices almost stationary. In the latter connection it may be remarked that, while concessions are still made by jobbers, the extent of the same is no greater than heretofore, and that producers, except possibly of low grade article, stand out firmly for old prices.

Red Lead, Litharge, &c.—Large consumers are still rather indifferent buyers, rarely placing orders for greater quantities than may be required to tide over immediate wants. Still, the deliveries are quite as liberal as usual at this season, when no special incentive to freer operation has existed and prices remain very steady on both wholesale quantities and ordinary jobbing parcels.

Zincs.—New orders for ordinary quality domestic Oxide are momentarily rather small, but deliveries on old contracts continue free, and the movement in that direction continues free enough to keep the market in very good form. High grade domestic product, the manufacture of which has increased more or less of late, is steadily gaining favor where imported stock was formerly used. The movement in imported Zincs is therefore rather slow in this market, but importations are gauged very closely to almost assured outlet, and the business passing is at the prices and terms quoted last week.

Colors, &c.—While hardly as free as were those of the previous week, purchases of the leading lines of Dry and Oil Colors adapted for house-painters' use have been very fair, and a good seasonable movement of specialties in that line and in ready-mixed Paints is also noted. Prices stand without material change, and, drawing the line at low-grade goods, the market retains very good tone. Paris Green has continued to move out quite freely, chiefly in small packages, and, with manufacturers closely sold up, prices remain very steady.

Miscellaneous.—Block Chalk on the spot brought \$2 75 ton, ex-steamer, which prices would indicate a quite firm market. Whiting is steady at old prices, with deliveries on former contracts still of considerable volume and new orders quite up to the average for the season. Putty of reputable brands brings former prices and sells very fairly; but there is still more or less doubtful quality stock that may be had at comparatively low rates. Barytes and Clays generally are quiet and moving at about former rates.

Oils and Turpentine.

Apart from a few fair-sized export purchases of refined Cotton Seed Oil, there has been merely a routine home trade distributive movement in Animal and Vegetable Oils, and the general situation is practically the same as it was a week ago. Domestic productions, without exception, are held firmly because of comparatively

high cost of raw materials and imported goods remain quite steady in the absence of heavy importations or any radical change in the foreign markets. It is a remarkable fact that, while scarcely any business of other than routine character is passing, the distribution is of very good volume; and the general market appears to be in favorable position for improvement, rather than any adverse turn in values in the immediate future.

Linseed Oil.—In this line no new features have developed. Competition is still within temperate bounds, and, while individual orders are chiefly of routine character, the aggregate movement is fully up to the average for the season. Hence prices for both city and out of town brands are well maintained, since second-hand offerings are now reduced to a minimum, while Western and Eastern crushers work together harmoniously. There is no intimation of any contemplated advance, but present appearances are that any change in the immediate future will more likely be upward than in the reverse direction.

Cotton-Seed Oils.—Exporters have purchased upward of 3500 barrels refined Oil, the greater portion of which is destined for Mediterranean ports. This movement makes a decided impression upon the available supply, leaving not over 4000 to 5000 barrels in the hands of other producers than the American and the Southern companies, whom, for the time being, seem to be acting in concert. On home account the buying has been of commonplace character, and the demand at present is moderate. However, the market seems to be gradually developing greater firmness, and on actual sale prices are $\frac{1}{2}$ ¢ @ 1¢ better at the present time than they were a week ago.

Lard Oil.—Prime quality Oil is very firmly held, with 59¢ for city and 58¢ for out-of-town brand, the prices generally quoted and no greater concession than 1¢ made where particularly attractive orders may be involved. Buyers are not taking hold with any unusual freedom, but the business passing is of quite good volume and surplus stock in pressers' and receivers' hands is very moderate. Cheaper prices than those now ruling are dependent in a good measure upon cost of raw material, which, to present appearances, is unlikely to be lower in the immediate future. Owing to light supply and enhanced cost of raw material, city pressers advanced their prices at the close to 60¢ @ 61¢, and receivers asked corresponding rates for out of town brands.

Menhaden Oil.—Crude product has been selling to a very fair extent at 29¢ @ 31¢, as to quality, and the market remains firm in the absence of other than merely fair new supplies or more favorable reports as to the catch of fish. In the pressed and bleached product jobbing distribution has continued very fair at about former prices.

Sperm and Whale Oils.—There have been no new developments here or in the East in the market for crude product. Sales unimportant and demand of routine sort, while sellers' prices remain without change. For the manufactured goods a steady but rather slow market prevails.

Olive Oil.—Common quality is quite firmly held for future delivery, and holders of spot stock therefore refuse to grant any concessions. Current business is of moderate volume, however, and the sales making are chiefly at the prices that have ruled for some little time past.

Spirits Turpentine.—Receipts have continued free enough to keep the total of receivers' holdings at about 2000 barrels during the greater portion of the week, in the face of quite free distribution. This, in turn, has had more or less unfavorable influence upon values, leading to a decline to 29 $\frac{1}{2}$ ¢ @ 29 $\frac{3}{4}$ ¢ for regular and 29 $\frac{1}{2}$ ¢ @ 30¢ for machine barrels.

The Lightning Rotary Corn Popper, Peanut and Coffee Roaster.

Donathen Novelty Mfg. Company, Kansas City, Mo., are putting on the market the article named above, which is repre-

neath or to the front of the machine. The corn is referred to as thus kept in constant motion over the fire, separating the popped from the unpopped corn so rapidly that the company claim that more corn can be popped with this machine than any other on the market. The heat is furnished by

the company's No. 30 machine, which is the popular size for country fairs, ball grounds and picnics. An important feature of this machine is that it can be converted into a peanut and coffee roaster by simply replacing wire cylinder by a solid iron cylinder, which is furnished at a small additional cost. These machines are described as neat and attractive, being handsomely painted, and are crated to be shipped safely any distance. The machine is made in a number of sizes, two of which are represented in the illustrations. It was patented February 2, 1892.

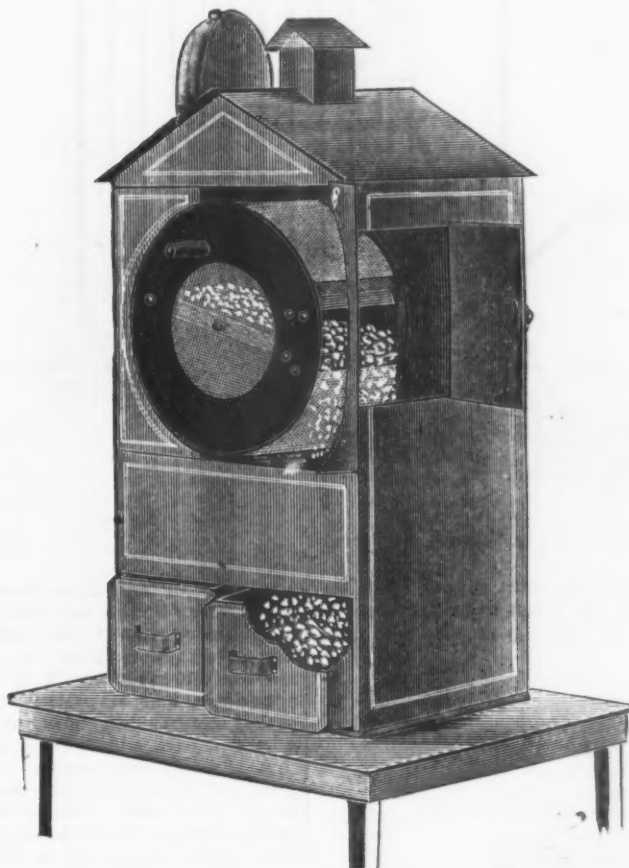


Fig. 1.—The Lightning Rotary Corn Popper, Peanut and Coffee Roaster.

sented in the illustrations given herewith. It is stated that the working parts of this device are constructed of iron, thus securing strength and durability. The outside case is described as made of heavy galvanized iron. The cylinder heads are of the same material with galvanized coarse and fine wire screen. The simplicity of oper-

suitable double and single gasoline burners of sufficient power to do the best work. They are placed at the point where corn falls when cylinder is in motion. An intense heat is thus created, and it is stated that the cylinder must be kept in motion while over the fire to prevent burning corn and wire in cylinder. The

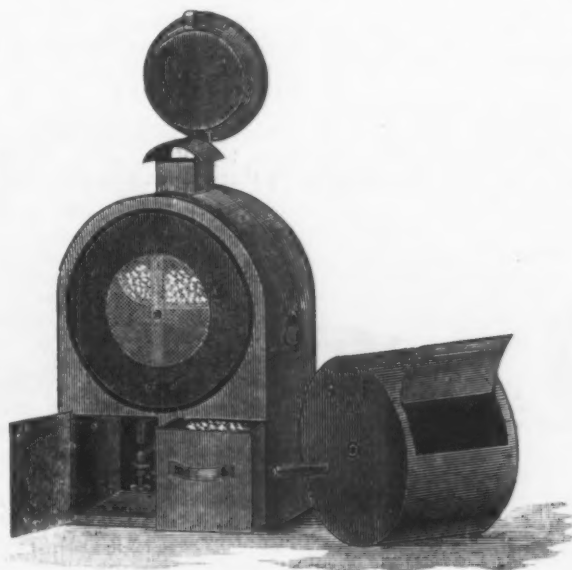


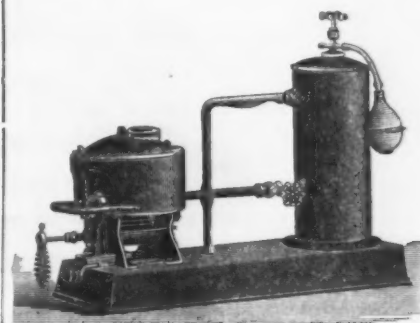
Fig. 2.—A Smaller Size of Lightning Popper.

ation of this machine is mentioned. When the corn is popped the coarse screen carries it to an opening in the side of the cylinder, which is opened and closed by the company's patent automatic door, which drops it into a box or pan under-

cylinder is stopped by swinging it out, an operation which, it is stated, can be done instantly. The machine is referred to as easily handled, the claim being made that anyone can soon learn to turn out from five to ten barrels flake corn per day with

Improved Gem Gasoline Soldering Furnace.

J. Burgess & Sons, proprietors of the Burgess Soldering Furnace Company, Columbus, Ohio, have brought out an improved form of their well-known Gem Gasoline Soldering Furnace for plumbers and tanners. The accompanying illustration presents a view of the Burgess Gem No. 4 Combination Furnace. The manufacturers point out that the burner is solid and made of cast iron, with no gauze or perforated tin in its construction, cylindrical in shape, and so designed that solder cannot fall into the perforation. The ends of the cylindrical burner are recessed in front and back to insure durability where subjected to rough usage, and the heater is described as noiseless and powerful in its operation, and will distribute heat the full length of the coppers. The support on which the coppers rest is but 5 inches



Improved Gem Gasoline Soldering Furnace.

from the bench, and the hood opening is of sufficient size to admit the largest coppers. It is claimed that this furnace will heat 4-pound coppers in two minutes and heat them to a red heat in four minutes and to a forging heat in five minutes. By removing the top lid from the furnace the opening will accommodate the ordinary metal pot for 12 pounds of solder, which, it is claimed, can be melted in from five to six minutes, the furnace heating the coppers and melting the metal at the same time. It is also designed for plumbers' use, it being provided with a handle so as to be readily transported. The reservoir acts on the pneumatic principle, so arranged that it cannot be filled while the burner is lighted, thus preventing danger of accident. It is further provided with a sliding drip cup and cut off knob, which, it is said, is always cool. The air, oil and regulating faucets are all furnished with stuffing nuts to prevent leakage, another improvement being a wrench, which is furnished for each furnace, for tightening the air faucets and nuts. The patent bulb is made of black rubber, the valve being located between the bulb and tube. The regulating valve, as shown in the cut, is provided with an Alaska handle, keeping it always cool. Another adaptation of the furnace is for printers' and dentists' use, an iron grating being provided to put over the top for a standard.

The Robinson Fence Machine.

Safety Gate Company, Richmond, Ind., are offering the above machine, as illustrated in the accompanying cuts. Fig. 1

indicated by the darts A A. The rollers may be removed if desired by removing the screws. Fig. 3 represents the upper end of the stretcher bar F, showing the manner of attaching one of the tensions to

from 2 to 5 feet in height may be built; a special machine being provided for weaving fence over 5 feet high. The manufacturers claim that three strands of No. 9 wire, with pickets $\frac{1}{2}$ to $\frac{3}{4}$ inch thick,

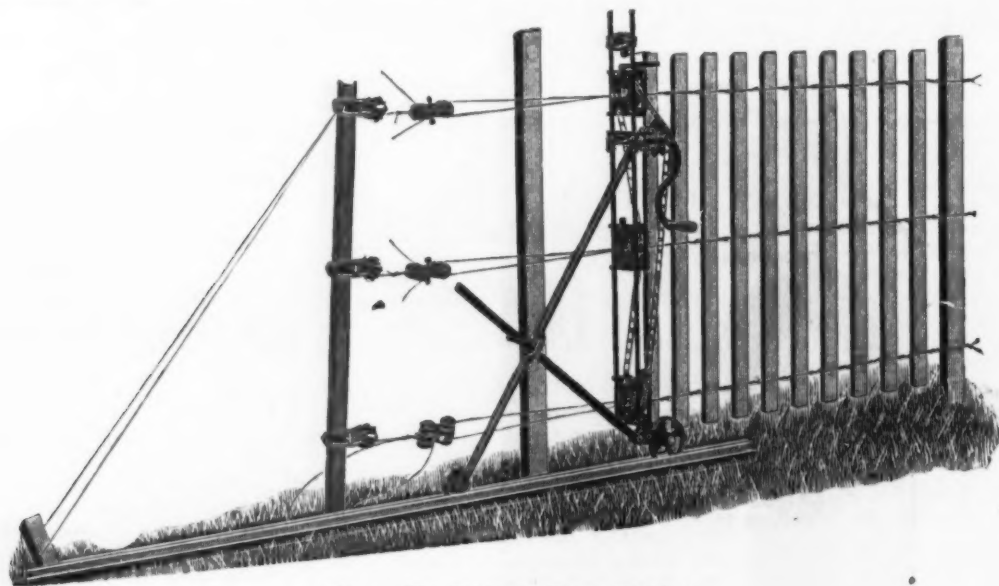


Fig. 1.—The Robinson Fence Machine.

represents the machine set up ready for weaving a three-double strand wire and picket fence. The machine will weave

it by means of the short wire C. The end of the wire that is left to be taken up by the twist in making the fence is indi-

2 inches wide and from 4 to 5 feet long, when woven by this machine have a combined strength of 8000 to 9000 pounds. The advantages claimed for this machine are as follows: That it is narrow and allows weaving past posts without trouble; that it requires no greasing of wires; that it passes over splices with perfect ease; that it has a spring tension, and does not jump and give slack wire; that each wire has an independent tension, and all wires can be drawn alike from the first picket; that it requires little room to set the tension; that the tension is regulated by the number of times the wire is wound around the rollers; that it weaves any size wire from No. 9 to the smallest size used in fence building; that it will weave on level, uneven or hilly ground equally well, and with all kinds of pickets, metal, wood, or those made from old plank, as well as young growing timber.



Fig. 2.—End View of Twister Wheel.

three, four or five double strands of wire, by adding a twister for each additional strand, or removing twisters if only two

cated by B B; and E E are the wires that lead to the starting post. It is stated that in passing splices in the wire, no

The Tip-Top Door Holder.

The Chillicothe Mfg. Company, Chillicothe, Ohio, are introducing a door holder, as illustrated herewith. It consists of a rod fastened by a screw eye to the casing over the door. A clamp rod extends down through a thimble, which is fastened near the top of the door, and also through an L-shaped piece, under which is a wing

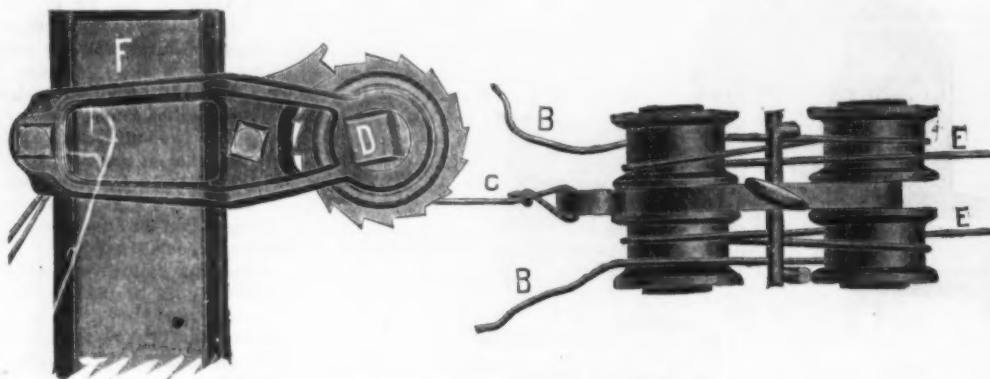


Fig. 3.—Stretcher Bar and Tension.

strands are wanted. Fig. 2 shows the construction of the twister wheel and the rollers for carrying the wires. The openings that the wire passes through are in-

trouble is experienced, as the rollers in the twister wheel take care of the splices, and they are passed without the knowledge of the operator. With this machine fences

nut. When the wing nut is loose, the door may be opened and shut as easily as any door. The door may, however, be fastened so as to stand 2 inches open, a

foot, half-way or clear back, by giving the nut a turn or two. In this manner the door will be held against any wind or jar or spring, but it need not be fastened so tightly that a person pushing the door cannot move it, to get in or out. It is stated that the door can be held so tight that a person will have to break something to get in, thus making a noise that will attract attention. The holder permits of



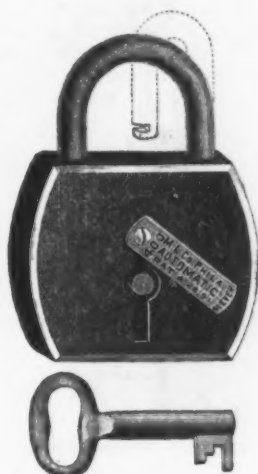
The Tip-Top Door Holder.

holding a door open for any degree of ventilation; to let fresh air in, or let out overheated or vitiated air, without constant slamming, or using two chairs or other objects.

The manufacturers claim that the holder takes the place of two chairs, or of a chair and a brick; that it has no springs to get out of order; that it is cheap and effective; that it can be used on right or left hand or double doors; and that it does not mar the carpet or floor. The holders are made to be used with either flush or projecting casing, and are finished in copper bronze and nickel plate.

Four-Lever Automatic Pad Lock.

Miller Lock Company, Philadelphia, Pa., are introducing a lock, as shown in the accompanying illustration. The cut



Four-Lever Automatic Pad Lock.

shows the lock full size, the weight of which is 1 ounce. In turning the key the shackle is thrown up, and as soon as it clears the top of the lock, turns around automatically as shown by the dotted line in the cut. In locking, it is only neces-

sary to turn the shackle around parallel with the lock, when it automatically drops into place. It is stated that the four levers afford a degree of security unprecedented in locks of such moderate price, and that over 100 changes are available in the lock. The automatic action is pleasing, novel and convenient. The lock is of brass, finished bright or nickel plated.

Dodd's Adjustable Window Shade Holder.

The Chas. E. Dodd Mfg. Company, Williamsport, Pa., are offering this article,



Fig. 1.—Dodd's Adjustable Window Shade Holder.

as illustrated in Fig. 1. The holder may be adjusted to the length of the shade roller by sliding the two parts of the holder out or in. Tin bands are furnished to fit around the ends of the brackets, by which the holder is fastened in place on the window frame. This allows the shade to be fastened inside the window frame or on the outside of the frame, as shown in Fig. 2. It is claimed that with the holder a window shade can be correctly put up in less than a minute without



Fig. 2.—Shade Holder Adjusted Outside of Frame.

screws, thus avoid defacing the window frame, and without necessitating cutting down the shade or roller, or placing a block on outside of frame, which is so often done to avoid cutting the shade.

The Rapid Spiral Screw Driver.

H. Mueller Mfg. Company, Decatur, Ill., are introducing a spiral screw driver, as illustrated herewith. The casing is made from heavy brass tubing and the spiral shaft from selected steel. The grooved spiral is made with a deep cut, and the thread in the sliding nut is solid from one end to the other, thereby making the tool, it is stated, strong and durable. The socket is made with a tapering hole, which admits of the use of any tool having a square tapering shank. This special feature is referred to as making it a very



The Rapid Spiral Screw Driver.

convenient tool, as any ordinary tool can be used in it, thus not confining itself to the use of the screw driver bits alone. Two

bits made from a good grade of steel, spring tempered, accompany each tool, one for large and one for small screws. The tool is furnished plain, also nickel plated with extra fine finished handle.

The Automatic Carpet Stretcher and Tacker.

The Bostwick & Burgess Mfg. Company, Norwalk, Ohio, are introducing this article, as illustrated in Figs. 1 and 2. It consists of a cylinder with a toothed stretcher at the end and a driving rod

with a knob at the top. The tacks are put into a T shaped slot at the top of the



Fig. 1.—The Automatic Carpet Stretcher and Tacker.

machine. The carpet is stretched into place, Fig. 2, and the machine brought to



Fig. 2.—The Manner of Stretching the Carpet.

an upright position, and held firmly in one hand. The tacks are brought succes-

which the tack is driven into the floor. The machine can be loaded with from 250 to 300 tacks, and weighs 3 pounds 7 ounces. The manufacturers claim that with the machine a carpet can be stretched and the tacks driven in one-third the time usually required, without getting on the knees.

The Acme Fastenings.

Caldwell Mfg. Company, Rochester, N. Y., are introducing fastenings for sash ribbon, as shown in Fig. 1. The Acme

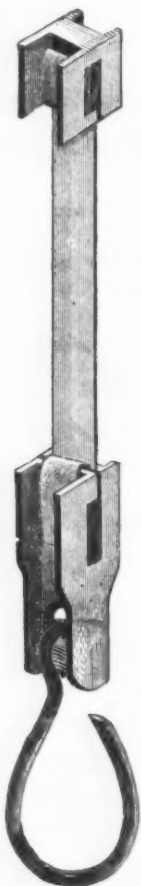


Fig. 1.—The Acme Fastenings.

contains but eight pieces per set, and it is stated is more easily attached than sash cord. It has been the company's aim to perfect an attachment for sash ribbons, com-

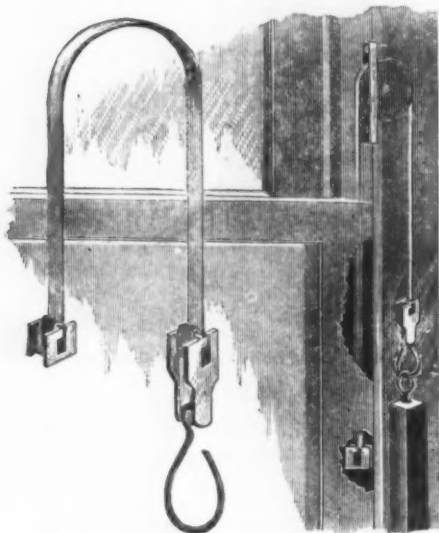


Fig. 2.—The Acme Fastenings Applied.

bining the greatest strength, durability and simplicity. The point is made that the mechanic does not have to make a difficult tie with a stiff ribbon, working inside of the

box frame. Fig. 2 shows the manner of applying the fastenings. An Acme sash ribbon is also made by the above company.

Dumb Waiter Check.

Sargent & Co., New York, have adapted their Eclipse door check, with some modi-

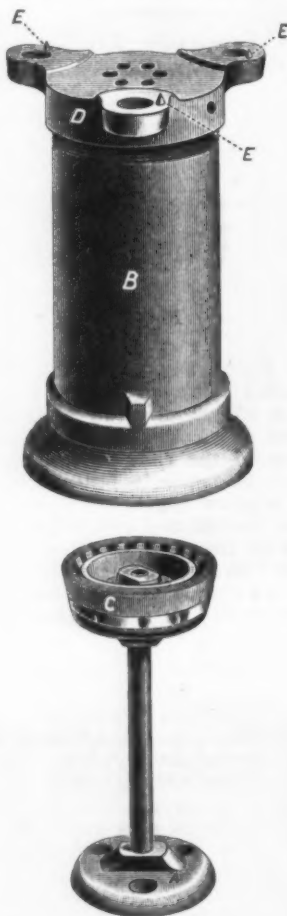


Fig. 1.—Dumb Waiter Check.

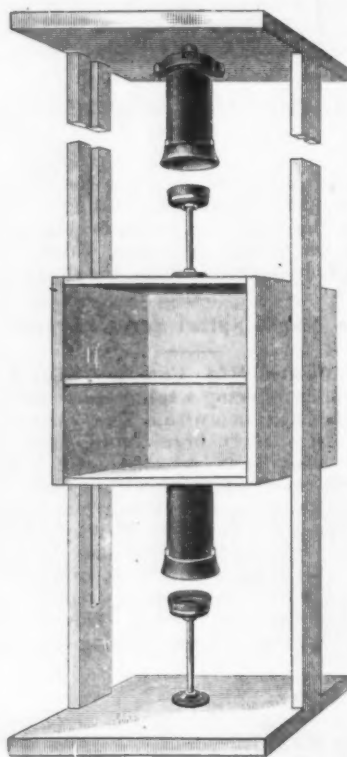


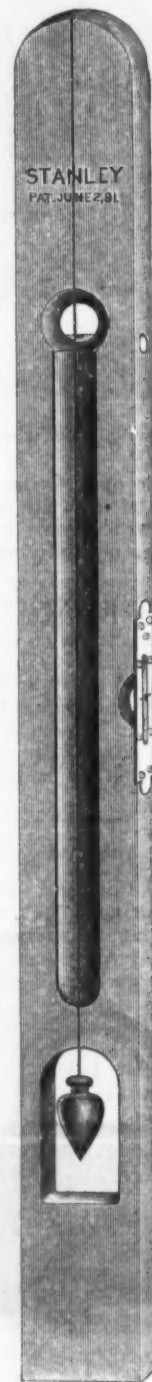
Fig. 2.—Application of the Check.

fications, as shown in Fig. 1, to be used on dumb waiters, as illustrated in Fig. 2. The principle of the Eclipse has thus been

brought into use as a check to prevent the sudden jar of dumb waiters as they ascend or descend. The manufacturers claim that it is easily put on, and when in use will save its cost many times over by preventing noise, by the absence of shock and consequent wear upon the fixtures and in the saving of china and glassware from breakage. It can be used on both the bottom and top of the dumb waiter, as shown in Fig. 2, or on the bottom only if preferred.

Improved Masons' Level.

A masons' level is ordinarily made of soft wood, both for lightness and for the smaller liability of the tool to dent or in any way disturb the surface of the work



Improved Masons' Level.

in hand. For this latter reason, too, usually no brass tips are used. The desired length is about 42 inches. Masons oftener hold the stock in a perpendicular position for determining whether work is plumb than they do horizontally for leveling. And it is here that this improved form of the stock is so well adapted to this par-

ticular level. The occupation of a mason is principally out of doors, and from the continual handling of brick and stone the fingers become stiff and the skin hardened. The shallow grooves along the two sides of the level illustrated herewith, which has just been put on the market by the Stanley Rule and Level Company, New

Band-Saw Holder.

Simonds Mfg. Company, Fitchburg, Mass., manufacturers of saws and machine knives, have an arrangement for carrying narrow band saws in hardware stores, as illustrated herewith. The saw is wound on a wooden wheel, the same width as the

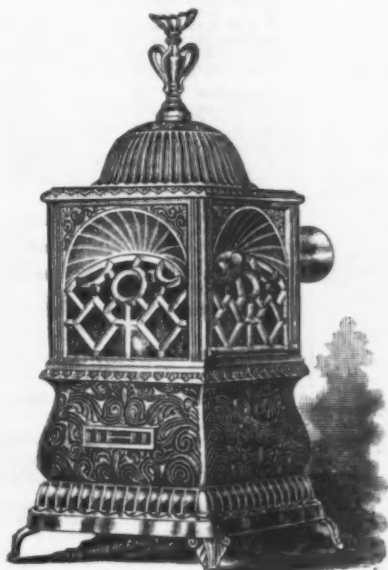


Band-Saw Holder.

Britain, Conn., afford the owner a firm grasp on the tool. Also, it is said, that in climbing ladders, or in walking on stagings, the peculiar form of the level gives a feeling of steadiness to the workman instead of requiring thought from him as to whether he is likely to drop the tool.

Toy Base Burner Stove.

The Henry C. Hart Mfg. Company, Detroit, Mich., are introducing the Pastime Base Burner Stove, as illustrated



Toy Base Burner Stove.

herewith. The stove is 5 1/2 inches square and 12 inches high, with red mica sections, which gives the effect of a coal fire by the use of a candle. The stove is finished black, nickel plated. This style of toy is referred to as something entirely new, there having been for a number of years toy cook stoves and ranges, but until this time no toy heating stove of this kind.

saw, after which the saw and wheel are placed in a wooden rim. A strip of wood is fastened across the rim on each side to prevent the saw from running off the wheel. An opening is cut in the rim through which the end of the saw projects. An iron hanger with set screw is attached to one of the strips, so arranged that the hanger may be slipped on to a square bar and fastened. The bar is held in place by brackets attached to the wall. The number of frames containing saws which may be hung on the bar is limited only to the length of the bar, six or eight saws, however, making a desirable assortment. The saws are furnished from 3/8 inch in width to 1 inch, and in coils of 200 or 300 feet each. The manufacturers state that these coils will not run, but that they revolve on the board when the projecting end is pulled out.

Business in the South is rapidly improving, as indicated by the condition of the industries at Chattanooga, Tenn. The pipe foundry has closed down one pit, but the workmen are employed in other departments. The Southern Car Works are running full time and have some large orders on hand. The Ross-Meehan Company are running half time, but will commence full time in about a week. The Southern Malleable Iron Company will resume operations on full time in a few days, giving employment to 125 men. The stove company report business good and a full force of men are kept busy.

Judged by the returns to the English Board of Trade, the imports of tin plates into the United States for the month of May were much less than for April. In April we imported a total of 70,489,102 pounds. The Board of Trade returns give the exports in May to the United States at 23,799 gross tons, or only 53,309,760 pounds. As compared with March, however, May imports show a slight increase. Not counting the abnormal imports in 1891, made to escape the increased duty, the imports of last April were, with one exception, the largest of any month on record. It is not surprising, therefore, that there should be a falling off in May, but so great a decrease was not expected.

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Clamps—

R. L. Tool Co.'s Wrought Iron.....	25¢
Adjustable, Cincinnati.....	15¢10¢
Adjustable, Cincinnati.....	15¢
Adjustable, Cincinnati.....	30¢10¢10¢
Stearns' Adjustable Cabinet and Cor- ner.....	30¢10¢10¢
Cabinet, Sargent's.....	60¢10¢
Carriage Makers', Sargent's.....	70¢10¢
Carriage Makers', P. & W. Co.....	40¢10¢
Sherrard Mfg. Co.....	40¢10¢40¢10¢
Warner's.....	40¢10¢40¢10¢
Saw Clamps, See Vices, Saw Filers'.....	
Carpenters', Cincinnati.....	25¢10¢

Clenvers.

Butcher's.....	25¢30¢
Bradley's.....	20¢25¢
L. & J. White.....	40¢40¢25¢
Scott's.....	40¢40¢25¢
New Haven Edge Tool Co.....	40¢
P. & W.....	33¢45¢33¢45¢
Foster Bros.....	80¢
Schultz, Lohoff & Co.....	40¢40¢25¢

Clips—

Norway, Axle, 1/4 & 3-10.....	55¢55¢25¢
and grade Norway Axle, 1/4 & 3-10.....	65¢25¢
Superior Axle Clips.....	60¢45¢70¢
Norway Spring Bar Clips, 3-10.....	50¢55¢25¢
Wrought-Iron Felice Clips.....	7¢
Steel Felice Clips.....	7¢
Saker Axle Clips.....	25¢

Cloth and Netting, Wire—See Wire, &c.

Cocks, Brass.....

Hardware list.....

Coffee Mills—See Mills, Coffee

Cellars, Dog, &c.....

Chapman Mfg. Company.....

Medford Fancy Goods Co.....

Leather, Pope & Stevens' list.....

Brass, Pope & Stevens' list.....

Combs, Curry.....

Fitch's.....

Rubber, per doz.....

American Curry Comb Co.....

Compasses, Dividers, &c.—

Compasses, Callipers, Dividers.....

Dividers.....

Compasses & Callipers.....

Wing and Inside or Outside.....

Double.....

Call's Pat. Inside.....

Excelsior.....

J. Stevens & Co.'s.....

Starrett's.....

Spring Callipers and Dividers.....

Lock Callipers and Dividers.....

Combination Dividers.....

Coopers' Tools—See Tools, Coopers'.

Cord—

Sash.....

Common.....

Patent, good quality.....

White Cotton Braided, fair.....

Common Russia Sash.....

 Patent Russia Sash..... || Cable Laid Italian Sash..... | 21¢22¢ |
India Cable Laid Sash.....	12¢
Silver Lax.....	
A Quality, White, 50¢.....	25¢
A Quality, Drab, 50¢.....	25¢
B Quality, White, 30¢.....	10¢
B Quality, Drab, 30¢.....	10¢
Sylvan Spring Extra Braided White, 34¢	
Sylvan Spring, Extra Braided, Drab, 30¢	
Semper Idem, Braided, White.....	30¢
Egyptian, India Hemp, Braided.....	25¢
Massachusetts, White.....	25¢
Samson—	
Braided, White Cotton, 50¢.....	30¢30¢5¢
Braided, Drab Cotton, 50¢.....	30¢30¢5¢
Braided, Italian Hemp, 50¢.....	30¢30¢5¢
Braided, Linen, 50¢.....	30¢30¢5¢
Tate's Cotton Braided, White.....	28¢10¢

Wire Picture.

Braided or Twisted.....

Wormscrews—See Screws, Cork.

Corn Nails and Cutters—See

Knives, Corn.

Crackers, Nut—

Table (H. & B. Mfg. Co.).....

Blake's Pattern.....

Turner & Seymour Mfg. Co.....

Cradles—

Crain.....

Crays.....

White Crays.....

D. M. Stewart Mfg. Co., Metal Work—

See also Chalk.

Crow Bars—See Bars, Crow.

Curry Combs—See Combs, Curry.

Curtain Pins—See Pins, Curtain.

Cutters—

Manit.

Dixon's.....

Woodruff's.....

Sales Pattern.....

American.....

Each.....

Each.....

Each.....

Each.....

Each.....

Draw Cut, each:

No. 5.....	2	6	8
\$50 \$75 \$80 \$225.....	20¢25¢		
Beef Shavers (Enterprise).....	30¢10¢30¢		
Little Giant (P. S. & W. Co.).....	50¢		
Chadborn's Smoked Beef Cutter.....	50¢		

Fibers.

Champion.....	30¢10¢30¢
All Iron.....	50¢
Nashua Lock Co.'s.....	15¢10¢50¢55¢
Wilson's.....	50¢
Sargent's.....	50¢
Acme.....	50¢

Fisher.

Smith's Pat.....	50¢
Johnson's.....	50¢
Penny's.....	50¢
Appleton's.....	50¢
Bonney's.....	50¢
Cincinnati.....	50¢

Dampers, &c—

Dampers, Buffalo.....	40¢10¢
Buffalo Damper Clips.....	40¢10¢
Crown Damper.....	40¢
Excelsior.....	40¢10¢

Diggers, Post Hole, &c—

Samson Post Hole Digger.....	50¢
Fletcher Post Hole Augers.....	50¢
Eureka Diggers.....	50¢
Lead's.....	50¢
Vaughan's Post Hole Auger.....	50¢
Kohler's Little Giant.....	50¢
Kohler's Hercules.....	50¢
Kohler's New Champion.....	50¢
Schneider.....	50¢
Ryan's Post Hole Diggers.....	50¢
Cronk's Post Bars.....	50¢
Gilbs Post Hole Digger.....	50¢
Imperial.....	50¢
Shimer's Hollow Handle.....	50¢

Dividers—

See Compasses.

Dog Collars—See Collars, Dog, &c.

Deer Springs—See Springs, Deer.

Drawers.

Money, per doz.....

Drawing Knives—See Knives,

Drawing.

Drills and Drill Stocks—

Blacksmiths'.....	each \$1.75
Blacksmiths' Self-Feeding.....	each \$7.50
Breast, P. S. & W.....	each \$1.50
Breast, Wilson's.....	each \$1.50
Breast, Millers Falls.....	each \$3.00
Breast, Bartholomew's.....	each \$3.50
Ratchet, Merrill's.....	each \$2.00
Ratchet, Ingersoll's.....	each \$2.00
Ratchet, Parker's.....	each \$2.00
Ratchet, Weston's.....	each \$2.00
Ratchet, Moore's Triple Action.....	each \$2.00
Ratchet, Curtis & Curtis.....	each \$2.00
Whitney's Hand Drill, Plain.....	\$11.00
Adjustable.....	\$12.00
Wilson's Drill Stocks.....	\$1.75
Automatic Boring Tools.....	\$1.75
Cleveland.....	50¢10¢25¢
Diamond, W. & B.....	50¢10¢25¢
Graham's Pat. Groove Shank.....	50¢10¢25¢
Morse.....	50¢10¢25¢
New Process.....	50¢10¢25¢
Standard.....	50¢10¢25¢
Syracuse (Metal list).....	50¢10¢

Drill Bits or Bit Stock Drills—

See Augers and Bits.

Drill Chucks—See Chucks.

Dripping Pans—See Pans, Dripping.

Drivers, Screw.

Douglas Mfg. Co.....	30¢30¢10¢
Diston's.....	50¢
Buck Bros.....	50¢
No. 64, Varnished Handles.....	65¢10¢
No. 86.....	70¢10¢
Sargent & Co's.....	60¢10¢10¢
No. 1 Forged Blade.....	60¢10¢10¢
No. 20, 30 and 60.....	60¢10¢10¢
P. S. & W.....	70¢
Knapp & Cowles.....	60¢25¢70¢
No. 1.....	60¢25¢70¢
No. 2.....	60¢25¢70¢
No. 3.....	60¢25¢70¢
No. 4 and 60, Acme and Ideal.....	50¢
Stearns'.....	35¢10¢25¢
Gay & Parsons.....	35¢
Champion.....	35¢10¢
Clark's Pat.....	30¢35¢
Crawford's Adjustable.....	25¢
Ellrich's Socket and Ratchet.....	25¢25¢10¢
Allard's Spiral, new list.....	25¢
Kohl's Common Sense.....	25¢25¢10¢
Syracuse Screw-Drive Bits.....	30¢50¢25¢
Screw-Drive Bits.....	50¢
Screw-Drive Bits, Parr's.....	50¢
Fray's Hol. Hdle. Sets, No. 3.....	12¢
P. D. & Co.'s all Steel.....	10¢
Chenault's.....	10¢
Brace Screw Drivers.....	10¢
Buck Bros' Screw-Drive Bits.....	10¢

Egg Beaters—See Beaters, Egg.

Egg Poachers—See Poachers, Egg.

Electric Bell Sets—See Bells, Elec-

tric.

Emery—No. 4 to No. 54 to Flour, CF

Each.....

Each.....

Each.....

Each.....

Each.....

Each.....

Each.....

Each.....

Each.....

Enamelled and Tinned Ware—

See Ware, Hollow.

Escutcheon Pins—See Pins, Es-

cutcheon.

Escutcheons.

Door Lock.....

Brass Thread.....

Wood.....

Expanded Metal.

List No. 5.

Lathing.....	10¢
Fencing, Painted Sheets.....	20¢
Door Mats, Galvanized.....	25¢
Window Guards, Painted.....	15¢
Tree Guards, Painted.....	15¢

Extractors, Lemon Juice—See

Squeezers, Lemon.

Fasteners, Blind—

Mackrell's.....	50¢
Van Sand's Screw Pat.....	50¢
Van Sand's Old Pat.....	50¢
Austin & Eddy No. 3008.....	50¢
Security Gravity.....	50¢
Zimmerman's.....	50¢

Faucets.—

Fenn's.....	40¢
Bohren's Pat. Rubber Ball.....	25¢
Fenn's Cork Stops.....	35¢
Star.....	60¢
Frary's Pat. Petroleum.....	40¢25¢
B. & L. B. Co.....	50¢
Star Metal Plug, new list.....	40¢
Lockport, Metal Plug, reduced list.....	50¢
Metallic Key, Leather Lined.....	60¢10¢
Cork Lined.....	70¢50¢10¢
Burnside's Red Cedar.....	60¢
Burnside's Red Cedar, bbl lots.....	50¢10¢
John Sommers'.....	50¢
Peerless Best Block Tin Key.....	40¢
LXI, 1st quality, Cork Lined.....	50¢
Diamond Lock.....	40¢
Perfection, Fla. Red Cedar.....	50¢
Goodenough Cedar.....	50¢
Best Metallic Key.....	50¢
Reliable Cork Lined.....	50¢
Western Pattern Cork Lined.....	50¢
Self-Measuring.....	50¢
Enterprise.....	50¢
Lane's.....	50¢
Victor.....	50¢

Felted Plates—See Plates, Felted.

Fifth Wheels.—

Derby and Cincinnati.....

Brewster.....

Files—

Domestic.....	50¢
Nicholson Files, Rasps, &c.....	50¢
Nicholson (X. F.) Files.....	25¢
Nicholson's Royal Files (Seconds).....	75¢
(extra prices on certain sizes).....	
G. & H. Barnett (Black Diamond).....	50¢
Arcade.....	50¢
Eagle.....	50¢
Other makers, best brands.....	50¢
Fair brands.....	50¢
Second quality.....	50¢
Heller's Horse Rasps.....	50¢
McCaffrey's Horse Rasps.....	50¢
Cheene orse Rasps, Hand Cut.....	50¢
Imported.....	50¢
Butcher.....	50¢
Stubs.....	50¢

Fixtures.

Grindstone—

Sargent's Patent.....

Reading Hardware Co.....

P. S. & W. Co.....

Fluting Machines—See Machines,

Fluting.

Fluting Scissors—See Scissors,

Fluting.

Fodder Squeezers—See Squeezers,

Fodder.

Frames—

Saw—

White Vermont.....

Red, Polished and Varnished.....

Plated, See Spoons.

Screens, Window and Door—

Porter's Pat. Window and Door Frame.....

Warner's Screen Corner Irons.....

Stearns' Frames and Corners.....

Cortland.....

Freezers, Ice Cream—

White Mountain.....

Granite State.....

Arctic.....

American.....

Buffalo Champion.....

Sherrard's Lightning.....

Blissard.....

Double Action Crown.....

Crown.....

Star.....

Peerless.....

Giant.....

Zero.....

Keystone, P. D. & Co. each.....

Fruit and Jelly Presses—See

Presses, Fruit and Jelly.

Fry Pans—See Pans, Fry.

Funnels.

Gersdorff's Perfection, Standard and

Globe.....

20 g; 5 to 10 g.....

Copper, 1 to 6 dms, 15 g; 6 to 12 g

dos, 20 g; over 12 dms.....

Furnaces, Soldering.

Burgess No. 3 Gem, tin reservoir.....

Burgess No. 3 Gem, copper reservoir.....

Fuses—Dia. 12 1/2.

Common Hemp Fuse, for dry ground.....	\$2.70
Common Cotton Fuse, for dry ground.....	3.30
Single Taped Fuse, for wet ground.....	3.30
Double Taped Fuse, for wet ground.....	3.30
Triple Taped Fuse, for very wet gr.....	5.00
Small Gutta Percha Fuse, for water.....	7.50
Large Gutta Percha Fuse, for water.....	12.00

Gates, Molasses—

Stebbin's Pattern.....	50¢50¢25¢
Stebbin's Genuine.....	50¢10¢10¢
Stebbin's Tinned Ends.....	40¢10¢
Chase's Hard Metal.....	50¢10¢
Bush's.....	50¢
Lincoln's Pattern.....	70¢70¢10¢
Weed's.....	30¢10¢
Boss, per doz.....	
No. 1, 2, 3, 4, 5, 6, 7, 8, 9, 10.....	50¢10¢10¢

Gauges.

Marking, Mortise, &c.....

Starrett's Surface, Center and Scratch.....

Stanley R. & L. Co.'s Butt and Rabbit

Gauge.....

Wire, Wheeler, Madden & Co.....</

Mallets.
Hickory.....20x10x30x10x10
Lignum vitae.....20x10x30x10x10
B. & L. Block Co., Hickory 30x30x10x10

Mattecks, Regular list.
60x10x60x10x25

Measures—
Standard Fiberglass, No. 1, peck, 7
dosen, 4; 1/2 peck, \$3.50.

Meat Cutters—See Cutters, Meat.

Menders, Harness—
Per dos.....\$2.00

Mills.
Coffee—
Box and Side, List Jan. 1, 1888, 60x10x10x10
Net prices are often made which are
lower than above discount.
American, Enterprise Mfg Co. 20x10x30x10
The Swift, Lane Bros.....30x10x10

**Mining Knives—See Knives,
Mining.**

**Melasses Gates—See Gates, Mo-
lasses.**

**Money Drawers—See Drawers,
Money.**

Mowers, Lawn.
Philadelphia.....60x10x10
Pennsylvania and Continental.....60x10x10
New Model and Excel for 60x10x10
Other Machines.....60x10x10x75

Muzzies—
Safety.....7 dos, \$3.00, 25 x

Nails.
Cut and Wire. See Trade Report.
Wire Nails, Papered.....25x10x10x10
Association list, Apr. 11, '92 80x10x10x10
Tack Mfrs. list.....70x70x10x10
Wire Nails, Standard Penny.
Card June 1 '89 base.....1.95 @ \$2.00

Horse—
Nos. 6 7 8 9 10
American.....84 84 84 84 84
Aussie.....32 32 32 32 32
Clinton, Fin. 19 17 15 14 13 30x10x10
Essex.....33 32 32 32 32
Lyra.....19 17 15 14 13 40x10x10
Snowden.....19 17 15 14 13 40x10x10
Vulcan.....33 32 32 32 32
Northwest.....33 32 32 32 32
A. C.....32 32 32 32 32
O. B. K.....32 32 32 32 32
Haud S.....32 32 32 32 32
Champlain.....32 32 32 32 32
Sarano.....32 32 32 32 32
Champion.....32 32 32 32 32
Capwell.....19 17 15 14 13
Anchor.....32 32 32 32 32
Western.....32 32 32 32 32
Empire Bronzed.....14 x 2

Picture—
Brass Head, Sargent's list.....50x10x10
Brass Head, Combination list.....50x10x10
Porcelain Head, Sargent's list.....50x10x10
Porcelain Head, Combination list.....50x10x10
Wife Patent.....40x10x10

Wall Pullers—See Pullers, Wall.

Wall Sets—See Sets, Wall.

Nut Crackers—See Crackers, Nut.

Nut—List Dec. 18, 1889.
Square, Hex.
Hot Pressed.....5.50 5.50 off list.
Cold Funched.....5.00 5.10 off list.
In packages of 100 b, add 1-100 b, add
1/2 p, net.

Oakum—
Best or Government.....7 @ 7 1/2
U. S. Navy.....7 @ 7 1/2
Navy.....7 @ 7 1/2

Oilers—
Zinc and Tin.....65x10x70x25
Brass and Copper.....60x10x60x10x25
Malleable, Hammer's Improved, No. 1,
\$1.50; No. 2, \$1.40; No. 3, \$1.30.
Malleable, Hammer's, Old Pattern, same
list.....40x10x10x10
Prior's Pat. or "Paragon" Zinc.....60x10x10x10
Prior's Pat. or "Paragon" Brass.....50x10x10x10
Olmstead's Tin and Zinc.....60x10x10x10
Olmstead's Brass and Copper.....60x10x10x10
Broughton's Zinc.....60x10x10x10
Broughton's Brass.....60x10x10x10
Gem P. D. & Co.....7 gro. \$3
Steel, Draper and Williams.....50x10x10x10

Openers, Can.
Messenger's Comet.....7 dos \$3.00, 25x
American.....7 gross \$2.75 @ \$3.00
Duplex.....dos 25x 15 @ 20x
Lyman's.....7 dos \$3.75, 20x
No. 4 French.....7 dos \$3.25, 60x
No. 5 Iron Handle.....7 dos \$3.00, 40x
Eureka.....7 dos \$3.50, 10x
Sardine Scissors.....7 dos \$3.75, 3.00
Star.....7 dos \$3.75
Sprague, No. 1, \$2.00, 2, \$2.35; 3, \$2.50
Explosor No. 1 \$2.50; No. 2, \$1.50.....40x
World's Best, 7 gross.....1.10 @ 1.20
No. 2, \$34.00; No. 3, \$36.00.....50x10x10
Universal, 7 dos \$3.00.....40x
Domestic, 7 dos \$2.50.....40x
Champion, 7 dos \$3.00.....60x

Packing, Steam—
Rubber—
Standard.....70x70x10x10
Extra.....60x60x10x10
Y. B. & P. Co. Standard.....50x
Y. B. & P. Co. Empire.....60x
Y. B. & P. Co. Salamander.....25x
Jenkins' Standard.....70x, 35x @ 25x

Miscellaneous—
American Packing.....10x @ 11x
Russia Packing.....14x @ 15x
Tallan Packing.....15x @ 14x
Johann Packing.....16x @ 17x

Pails.
Galvanized Iron—
Quarts 10 12 14
Hill's Light Weight, 7 dos, \$2.75 3.00 3.25
Hill's Heavy Weight, 7 dos, 3.00 3.25 3.75
Helwig's.....2.50 2.75 3.00
Sidney Shepard & Co.....3.35 2.85 3.06
Iron Clad.....2.60 2.75 3.00
Fire Buckets.....2.75 3.25 3.50
Buckets, see Well Buckets.

Indurated Fibre Ware—
Star Pail, 12 qt.....7 dos \$5.40
Stable and Milk, 14 qt.....7 dos \$6.00
Fire Pails, deep.....7 dos \$5.40
" round bottom.....7 dos \$7.80

Standard Fibre Ware—
Plain. Dec'd
Water Pails, 12 qt., per doz.....\$4.00 \$4.50
Large sizes.....4.00 4.50
Fire Pails, No. 1, 12 qt., per doz 4.50
Fire Pails, No. 2, 14 qt., per doz 5.00
Sugar Pails.....6.00 6.50
Horse Pails.....6.00
Buggy Pails.....4.00
Shop Jars (bat. trap).....3.00 9.00
Chamber Pails, 14 qt.....6.50 7.50

Pans.
Dripping.
Small sizes.....7 @ 6 1/2
Large sizes.....7 @ 6 1/2
Silver & Co. (Covered).....40x

Fry—
Standard List:
No.....0 1 2 3 4
7 dos, \$3.00 \$3.75 \$4.25 \$4.75 \$5.25
No.....5 6 7 8
7 dos, \$6.00 \$7.00 \$8.00 \$9.00
Polished, regular goods.....75x @ 10x
Acme Fry Pans.....60x @ 10x

Dust—
Steel Edge, No. 1.....7 dos \$1.75

Paper and Cloth—
Sand and Emery—
List April 19, 1888.....50 @ 50x10x10
Sibley's Emery and Crocus Cloth.....30x

Parers.
Apple.
Advance.....7 dos \$4.75
Baldwin.....7 dos \$5.25
Bonanza.....each 5.00
Daisy.....7 dos 4.00
Dandy.....each 7.50
Eclipse.....7 dos 4.25
Eureka, 1888.....each 12.00
Family Bay State.....7 dos 12.00
Favorite.....7 dos 5.00
Gold Medal.....7 dos 4.00
Ideal.....7 dos 4.00
Improved Bay State.....7 dos \$7.00 @ 8.00
Little Star.....7 dos 4.50
Monarch.....7 dos 12.50
New Lightening.....7 dos 5.50
Orion.....7 dos 4.00
Penn.....7 dos 4.00
Perfection.....7 dos 4.00
Pomona.....7 dos 4.00
Poking Table.....7 dos 6.00
Turn Table.....7 dos 4.50
Victor.....7 dos 13.50
Waverly.....7 dos 4.00
White Mountain.....7 dos 4.25
78.....7 dos 7.00

*White Mountain.....7 dos \$4.50
Antrim Combination.....7 dos \$5.50
Hoosier.....7 dos \$13.50
Saratoa.....7 dos \$5.50*

Pencils—
Faber's Carpenters.....high list 50x
Faber's Round Gilt.....7 gro \$5.25
Dixon's Lead.....7 gro \$4.50
Dixon's Lumber.....7 gro \$6.75
Dixon's Carpenters.....10x

Picks—
Railroad or Adse Eye, 5 to 6, \$12.00;
6 to 7, \$13.00.....60x10x60x10x55

Picture Nails—See Nails, Picture.

Pinking Irons—See Irons, Pinking.

Pins.
Sew—
Humason, Beckley & Co.'s.....60x10x10
Sargent & Co.'s.....\$17 and \$18.....60x10x10
Peck, Stow & W Co.....60x10x60x10x55

Curtain—
Silvered Glass.....net
White Enamel.....net
Enamelon.....net

*Iron, list Nov. 11, 1885.....50x10x60x10x55
Brass.....60x @ 50x*

Pipe, Wrought Iron—
List September 18, 1889.
1 1/2 and under, Plain.....50x5 @ 60x10x10
1 1/2 and under, Galvanized.....50x5 @ 60x10x10
1 1/2 and over, Plain.....70x5 @ 70x10x10
1 1/2 and over, Galvanized.....60x5 @ 60x10x10
Boiler Tubes,
Sizes up to 2 1/2 in. inclusive.....57 1/2 @ 60x
Sizes 3 in. and larger.....60x @ 60x
Castings.....60x
Inserted Joints Castings.....50x
Steel Boiler Tubes.....30x

Planes and Plane Irons—
Wood Planes—
Molding.....40x10x10
Bench, first Quality.....60x10x10
Search, Second Quality.....55x10x10
Bailey's (Stanley R. & L. Co.).....60x10x10

Iron Planes—
Bailey's (Stanley R. & L. Co.).....50x10x10
Miscellaneous Planes (Stanley R. & L. Co.).....25x10x10
Morse's Iron Planes.....35x @ 35x10x10
Morden M. Iron Co.'s.....40x @ 40x10x10
Davis's Iron Planes.....40x @ 40x10x10
Birmingham Plane Co.....50x @ 50x10x10
Gage Tool Co.'s Self-Setting.....30x @ 30x10x10
Chaplin's Iron Planes.....40x @ 40x10x10
Sargent's.....30x @ 30x10x10
Standard Tool Co.....50x @ 50x10x10

Plane Irons—
Butcher's.....\$5.00 @ \$5.25 to 30x
Buck Bros.....30x
Auburn "Thistle".....30x @ 10x
Ohio.....30x @ 10x
Sandusky.....35x
S. & J. White.....35x
Stanley R. & L. Co.....60x10x10

Plates.
Felloe.....7 @ 6 1/2 @ 6 1/2

Pliers and Nippers.
Button's Patent.....50 @ 50x10x10
Hall's No. 2, 5 in., \$13.50; No. 4, 7 in.,
\$21.00 7 dos.....40x
Humason & Beckley Mfg. Co. 50 @ 50x10x10
Lindsay's Giant.....40x
See Pliers.....40x

Gas Pliers, Custer's Nickel Plated.....60x55
Eureka Pliers and Nippers.....40x
Russell's Parallel.....25x
P. S. & W. Cast Steel.....60x
P. S. & W. Tinnars' Cutting Nippers,
add 5x dis 10x
Carew's Pat. Wire Cutters.....30x
Morrill's Parallel, 7 dos, \$12.00.....30x @ 30x
Cronk's 8 in., \$15.00; 10 in., \$21.00.....50x @ 50x
Cronk's Button Pat. term.....50 @ 50x10x10
Cronk's Carrier Pli ra.....60 @ 60x10x10

Plumbs and Levels—
Regular List.....75x @ 75x10x75x10x55
Stanley's Duplex.....20x10x10
Stanley's Handy.....20x10x10
Diaton's.....70x @ 70x10x70x10x10x10
Pocket Levels.....50x
Davis Iron Levels.....30x
Davis' Inclinoimeters.....10x @ 10x

Punchers.
Egg.
Buffalo Steam Egg Poachers, 7 dos, No. 1,
\$1.00; No. 2, \$2.00.....25x
Silver & Co., 6-Ring, 7 dos \$4; 3-Ring \$2

Pokes, Animal—
Bishop's, L. L.....7 dos \$6.00
Bishop's O. E.....7 dos \$5.25
Bishop's Pioneer.....7 dos \$3.75
Bishop's American.....7 dos \$2.75
Eagle, Double Stale.....7 dos \$5.75
Eagle, Single Stale.....7 dos \$3.75
Ruckey's, Single Stale.....7 dos \$2.75
Boiding.....7 dos \$5.00

Police Goods.
R. I. Tool Co., Handcuffs, \$15.00 7 dos 10x
R. I. Tool Co., Leg Irons, \$26.00 7 dos 10x
Towers.....25x
Daley's Improved Handcuffs: 2 Hands,
Polished, 7 dos \$48.00; Nickel, \$57.00;
3 Hands, Polished, 7 dos \$72.00; Nickel, \$84.00.....25x
J. P. Lovell's Police Goods.....25x

Pollish, Metal.
Prestoline.....30x
Prestone Paste.....30x
Gaston's Silver Compound.....33x @ 33x

Pollish, Stone.
Joseph Dixon's.....7 gro \$6.00, 10x
Gem.....7 gro \$4.50, 10x
Gold Medal.....7 gro \$6.00, 25x
Mirror.....7 gro \$6.00, 10x
Lustro.....7 gro \$4.75
Ruby.....7 gro \$3.75
Rising Sun, 5 gro lots.....7 gro \$5.50
Dixon's Plumbago.....7 x 2
Boynton's Noon Day, 7 gro.....25.00
Parlor Pride Stone Enamel.....7 gro
Yates' Liquid, 2 3 5 10 gal.....
Yates' Gal.....\$0.80 .70 .60 .50

Standard Paste Pollish, 10 cans.....12 1/2 @ 12 1/2
Jet Black.....7 gro \$3.50
Japanese.....7 gro \$3.50
Firestone.....7 gro \$2.50
Diamond O. K. Enamel.....7 gro \$10.00
Bonnell's Liquid Stone Pollish, 7 gro \$2.50
Bonnell's Paste Stone Pollish, 7 gro \$6.00
Black Eagle Benzine Paste, 5 and 10 x
cans.....12 1/2 @ 12 1/2
Black Jack Water Paste, 5 and 10 x
cans.....12 1/2 @ 12 1/2
Nickel Plate Paste.....7 gro \$4.00
Crown Paste.....7 gross \$7.25
Crown Paste, in 5 and 10 x pails 7 x 12 1/2
Black Flag.....7 gross \$7.30
Black Flag, 5 and 10 x pails.....7 x 12 1/2
Black Flag, liquid, in bottles, 7 gro \$8.00
Diamond Rock Nickel Cleaner.....7 gro \$10.30

Peppers, Corn—
Round or Square, 1/4 qt., 7 gr \$10.00 @ 10.50
Round or Square, 1/2 qt., 7 gr \$15.00 @ 15.50
Round or Square, 3/4 qt., 7 gr \$18.50 @ 19.00

Post Hole and Tree Augers and Diggers—See Diggers, Post Hole, &c.

Potato Parers—See Parers, Potato.

Pot.
Glass—
Tinned.....40x @ 40x10x40x10x55
Enameled.....40x @ 40x10x40x10x55
Family, Howe's "Eureka".....40x
Family, L. F. C.'s "Handy".....50x

Powder.
In Containers—
Fine Sporting, 1 b each.....\$0.90
Duck, 1 b each......60
Duck, 1/2 b each......40
Rifle, 1 b each......30
Rifle, 1/2 b each......15

In Kegs—
Rifle, 25-7 kegs.....\$5.50
Rifle, 12 1/2-5 kegs.....3.00
Rifle, 6-3 kegs.....1.45
Duck, 12 1/2-5 kegs.....5.75
Duck, 6-3 kegs.....3.00
Trap, 25-5 kegs.....6.50
Trap, 12 1/2-5 kegs.....3.50
Trap, 6-3 kegs.....1.90

Presses.
Press and Jelly—
Enterprise Mfg. Co.....30x @ 30x10x30x10
Henis.....7 dos \$3.50
Shepard's "New City".....40x
Silver & Co.....7 dos \$3.75

Pruning Hooks and Shears—
See Shears.

Pullers.
Nail.
Scranton.....7 dos \$13.00, 33x @ 33x
Curtis Hammer.....7 dos \$0.00
Giant, No. 1.....7 dos \$13.00, 10x
Giant, No. 2.....7 dos \$15.00, 10x
Police.....7 dos \$0.00, 25x
Eclipse.....each \$3.00 net
Economy.....7 dos \$6.00

Fullers.
Hot House, Awning, &c.....60x10x10
Japanned Screw.....60x10x10
Brass Screw.....60x10x10
Japanned Nut.....60x10x10
Japanned Clothes Line.....60x10x10
Empire Sash Pulley.....55x @ 55x
Moore's Sash, Anti-Friction.....60x
Hay Fork, Solid Eye, \$4.00; Swivel, \$4.50.....50x @ 50x10x50x10x55
Hay Fork, "Anti-Friction," 7 in. Solid, \$5.70.....50x
Hay Fork, "T" Common and Pat. Bushed.....30x
Hay Fork, Tarbox Pat. Iron.....30x
Hay Fork, Reed's Self-Lubricating.....45x
Teckle Block.....See Blocks
Moore's Anti-Friction 5 in. Wheel, 7 dos \$13.00.....40x

Pumps—
Cistern, Best Makers.....60 @ 60x10x10
Pitcher Spout, Best Makers.....67 @ 67x10x10
Pitcher Spout, Cheaper G'ds.....75 @ 75x10x10

Punches—
Saddlers' or Drive, good, 7 dos.....60x @ 60x55
Bemis & Call Co.'s Cast Steel Drive, 50x55
Bemis & Call Co.'s Springfield Rocket, 50x55
Spring, good quality.....7 dos \$3.50 @ 2.60
Spring, Leach's Pat.....15x
Bemis & Call Co.'s Spring and Check.....40x
Solid Tinnars' P. S. & W. Co., 7 dos \$1.44, 55x
Tinnars' Hollow Punches P. S. & W. Co. 30x25
Rice Hand punches.....15x
Avery's Revolving.....40x
Avery's Saw-Set and Punch. See Saw Sets.

Rail—
Sliding Door, Wrt Brass, 7 x 35.....15x
Sliding Door, Bronzed Wrt Iron.....7 ft. 7x
Sliding Door, Iron, Painted, 7 foot 4 1/2, 40x
Barn Door Light In.....4 1/2
Per 100 feet.....\$2.00 2.50 3 1/4, 10x
B. D. for N. E. Hangers.....

Small, Med. Large.
Per 100 set.....\$2.15 2.70 3.35 net
Terry's Steel Rail, 7 foot.....40x
Victor Track Rail, 7 x foot.....50x
Carrier, double, braced, Steel Rail, 7 foot.....40x
Moore's Wrought Iron.....40x @ 40x
Moody Steel Rail.....45x

Rakes—
Cast Steel, Association goods.....65x @ 70x
Cast Steel, outside g'ds. 50x10x10x70x55
Malicobin.....70x @ 70x55
Gibbs Lawn Rake.....7 dos \$4.90
Canton Lawn Rake.....7 dos \$3.75
Favorite Lawn Rake.....7 dos \$4.40
Ft. Madison Prize Bow Brace and Peerless.....60x
Fort Madison Steel Tooth Lawn Rake.....35x

Razors.
J. R. Torrey Razor Co.....30x
Wostenholme and Butcher, \$10 to \$1.10x
Jordan's AAAI, new list.....net
Jordan's Old Faithful, new list.....net
Galvanic.....7 dos \$15.00

Electric Cutlery Co.....Net
Razor Strops—See Strops, Razor, Rings and Ringers.

Rings and Ringers.
Bull Rings—
Union Nut Co.....55x
Sargent's.....60x @ 60x10x70x55
Hotchkiss' low list.....30x
Humason, Beckley & Co.'s.....70x @ 10x
Peck, Stow & W. Co.'s 50x10x60x10x10x10
Ellrich Hdw. Co., White Metal, low list.....60x @ 50x10x10

Hog—
Top of the Hill Ringers.....7 dos \$3.00
Top of the Hill Ringers.....7 dos \$1.25
Hill's Improved Ringers.....7 dos \$1.12 1/2
Hill's Old Style Ringers.....7 dos \$1.12 1/2
Hill's Tones.....7 dos \$3.00
Hill's Rings.....7 dos \$1.00
Perfect Rings.....7 dos \$1.50
Perfect Ringers.....7 dos \$3.15 @ 3.25
Blair's Hog Ringers.....7 dos \$3.00
Blair's Hog Ringers.....7 dos \$9.00 @ 10.00
Champion Ringers.....7 dos \$2.00
Champion Rings, Double.....7 dos \$3.25
Brown's Ringers.....7 dos \$3.00
Brown's Rings.....7 dos \$1.50 @ 1.25
Electric Hog Rings.....7 dos \$1.50
Electric Hog Ringers.....7 dos \$3.00
Major Rings.....7 dos \$1.25
Major Ringers.....7 dos \$3.00

Rivets and Rivets—
Iron, list Nov. 17, '87.....40x
Copper.....60x @ 10x
Coppered Iron, Bettina Brand.....40x
Rivet Sets—See Sets.

Rods.
Stair, Brass.....32x @ 32x
Stair, Black Walnut.....7 dos 40x

Rollers.
Barn Door, Sargent's list.....60x @ 60x10x10x10
Acme Moore's Anti-Friction.....55x
Union Barn Door to Hill.....70x
Thompson Mfg. Co.'s Lawn Rollers.....30x

Rope.
Manila, 7-16 in. diam. and larger 7 x 12 1/2 @ 12 1/2
Manila.....7 in. 7 x 12 1/2 @ 12 1/2
Manila, 7 and 8-16 in. 7 x 13 1/2 @ 13 1/2
Manila Tarred Rope.....7 x 11 1/2 @ 11 1/2
Manila, Hay Rope.....7 x 12 1/2 @ 12 1/2
Sisal.....7-16 inch and larger 7 x 10 1/2 @ 10 1/2
Sisal.....7 in. 7 x 10 1/2 @ 10 1/2
Sisal.....7 and 8-16 in. 7 x 11 1/2 @ 11 1/2
Sisal, Hay Rope.....7 x 10 1/2 @ 10 1/2
Sisal, Tarred Rope.....7 x 9 1/2 @ 9 1/2
Sisal, Medium Lath Yarn.....7 x 8 1/2 @ 8 1/2
New Zealand.....7 in. 7 x 9 1/2 @ 9 1/2
New Zealand, 7 and 8-16 inch, 7 x 9 1/2 @ 9 1/2
New Zealand, Hay Rope.....7 x 8 1/2 @ 8 1/2
New Zealand, Tarred Rope.....7 x 8 1/2 @ 8 1/2
Note.—Manufacturers' prices on above 1 1/2 x less, f.o.b. factory—less 1 1/4 x for cash.

Cotton Rope.....7 x 13 1/2 @ 13 1/2
Jute Rope.....7 x 6 1/2 @ 6 1/2

Wire—
List February, 1892.
A 1 kinds.....45x

Rules.
Boxwood.....50x @ 50x10x10x10
Ivory.....50x @ 50x10x10x10
Sharrett's Rules and Straight Edges, Steel.....35x @ 35x10x10

Sad Irons—See Irons, Sad.

Sand and Emery Paper and Cloth—See Paper and Cloth, Sand and Emery

Sash Cord—See Cord, Sash.

Sash Locks—See Locks, Sash.

Sash Weights—See Weights, Sash.

Sawage Stuffers or Fillers—See Stuffers or Fillers, Sawage.

Saws—The following prices are often cut by jobbers.
Diaton's Circular.....45 @ 45x55
Diaton's Cross Cuts.....45 @ 45x55
Diaton's Hand.....30 @ 30x55
Woodrugh & McFarlin.....35 @ 35x55
Hand, Panel and Rip.....25 @ 25x55
Narrow Champion Cross Cuts with Handles, 7 foot.....15 @ 30x
Champion Thin Back Cross Cuts, 7 foot.....30 @ 30x55
Champion Extra Thin Back Cross Cuts, 7 foot.....25 @ 30x55
One Man Champion Cross Cuts, 7 foot.....37 @ 40
Wheeler, Madden & Clemson Mfg. Co., Hand, Panel and Rip.....30 @ 30x55
Narrow Champion Cross Cuts with Handles, 7 foot.....15 @ 30x
Champion Thin Back Cross Cuts, 7 foot.....30 @ 30x55
Champion Extra Thin Back Cross Cuts, 7 foot.....25 @ 30x55
One Man Champion Cross Cuts, 7 ft.....37 @ 40

Atkins' Circular Shingle & Heading... 60	Sharpeners, Knife...	Utica P. & T. Skins... 60	Lightning Screw Plate... 25
Atkins' Silver Steel Diamond X Cuts	Atkins...	Utica Turned and Fitted... 35	Reece's New Screw Plates... 35
Atkins' Special Steel Dexter X Cuts	Applewood Handles... \$ dos 26.00, 40	Blates—	Reversible Hatchet... 30
Atkins' Special Steel Diamond X Cuts	Rosewood or Cocoboa s. \$ dos 1900 40	School, by case... 50	Gardner... 35
Atkins' Champion and Electric Tooth	Knives, Spoke	Snaps, Harness, &c.—	Stops, Bench.
X Cuts... foot 30	Iron... 45	Anchor (T. & A. Mfg. Co.)... 65	Morrill's... \$ dos 30, 30
Atkins' Hollow Back X Cuts... foot 30	Valley's (Stanley B. & L. Co.)... 30	Piton's (Bristol)... 50	Hotchkiss's... \$ dos 10, 10
Atkins' Muley, Mill and Drag... 40	Stearns... 30	Hotchkiss... 10	Weston's, No. 1, \$10; No. 2, \$9.25
Atkins' One-Man Saw, with handles...	Cincinnati... 35	Andrews... 50	McGill's... \$ dos 3, 3
Peace Circular and Mill... 45	Goodell's... \$ dos 30.00... 35	Sauger's Patent Guarded... 70	Terrell's Nos. 1 and 2, \$ dos, \$3; No. 3, \$3.50
Peace Hand Panel and Rip... 25	Shears—	German, new list... 40	Stone—
Peace Cross Cuts... 45	American (Cast) Iron... 75	Covert... 50	Scythe Stones.
Richardson's Circular and Mill... 45	Barnard's Lamp Trimmers... \$ dos 3.75	Covert, New Pat. ... 50	Pike Mfg. Co. if Ap 11, 1892... 33
Richardson's X Cuts... 45	Tinners', List, Dec. 1881... 30	Covert, New Pat. ... 50	Pike Mfg. Co.
Richardson's Hand, &c., Hand, Panel and Pin... 45	Heinrich's, List, Dec. 1881... 30	Covered Spring... 60	Hindostan No. 1... 8
Back Saws—	Heinrich's Tailor's Shears... 33	E. Covert's Triumph... 33	Hand Stone... 8
Griffin's, complete... 40	Cast Steel Trimmers... 30	Snaths, Scythes.	Washita Stone, Extra... 10
Griffin's Back Saw, Blades... 40	First quality... 30	Soldering Irons—See Irons, Soldering.	Washita Stone, No. 1... 10
Star Back Saws and Blades... 25	Second quality... 30	Spittoons, Cuspiders, &c.	Washita Stone, No. 2... 10
Bureka and Crescent... 30	Acme Cast Shears... 10	Standard Fibers—	Washita Stone, No. 3... 10
Scroll—	Diamond Cast Shears... 10	Cuspiders, 3 1/2-inch, \$ dos., No. 5, \$3; No. 6, \$4	Arkansas Stone, No. 1, 3 to 5 1/2 in... 2.80
Lester, complete, \$10.00... 25	Victor Cast Shears... 75	Spittoons, Dally, 3-inch, No. 1, \$4; 10 and 11 inch, \$6	Turkey Oil Stone, 4 to 5 in... 3.50
Rogers, complete, \$4.00... 25	Howe Bros. & Hulbert, Solid Forged Steel... 40	Spoke Shaves—See Shaves, Spoke.	Turkey Slips... 2.00
Barnes' Builders' and Cab. Makers' \$15.25	Chicago Drop Forge & F. Co., Solid Steel Forged... 40	Spoke Trimmers—See Trimmers, Spoke.	Lake Superior, Chase... 1.50
Barnes' Scroll Saw Blades... 35	Davenport Cutlery Co... 40	Speons and Feras—	Lake Superior Slips, Chase... 2.00
Saw Frames—See Frames, Saw.	Clauss Shear Co., Japaned... 70	Tinned Iron—	Steve Polish—See Polish, Steve.
Saw Sets—See Sets, Saw.	Clauss Shear Co., Nickleed, same list... 60	Basting, Cen. Stamp, Co.'s list... 70	Stretchers, Carpet.
Saw Tools—See Tools, Saw.	Galvanic, 3/4 to 2 in, \$ dos, \$1.00 inch Electric Cutlery Co... Net	Solid Table and Tea, Cen. Stamp, Co.'s list... 70	Cast Iron, Steel Points... \$ dos 1.75
Hatch, Counter, No. 171, good quality... \$ dos \$7.00	Pruning Shears and Hooks.	Buffalo S. S. & Co... 33	Sockets... \$ dos 1.75
Hatch, Tea, No. 161... \$ dos \$7.50	Diston's Combined Pruning Hook and Saw... \$ dos 15.00, 20	Silver-Plated—(4 mos. or 5% cash 30 days)	Guildard's... 3.00
Union Platform, Plain... \$2.10 to \$2.30	Diston's Pruning Hook... \$ dos 12.00	Meriden Brit. Co., Rogers... 40	Strops, Raker—
Union Platform, Striped... \$3.40 to \$3.60	E. S. Lee & Co.'s Pruning Tools... 40	Rogers & Bros... 40	Genuine Emerson... 60
Chatillon's Grocers' Trip Scales... 60	Pruning Shears, Henry's Pat... \$ dos 3.75 to \$4.00	Rogers & Bros... 40	Imitation... \$ dos 12.00, 10
Chatillon's Eureka... 40	Henry's Pruning Shears... \$ dos 4.25 to 4.50	Reed & Barton... 40	Torrey's... 30
Chatillon's Favorite... 40	Wheeler, M. & C. Co.'s Combination... \$ dos 12.00, 20	Wm. Rogers Mfg. Co... 40	Badger's Belt and Com... 30
Family, Turnbuckle... 40	Dunlap's Saw and Chisel... \$ dos 3.50, 30	Simpson, Hall, Miller & Co... 40	Lamont Combination... \$ dos 4.00
Richie Bros.' Platform... 40	J. Mallinson & Co., No. 1, \$5.25; No. 2, 7.25	Holmes & Edwards Silver Co... 40	Jordan's Pat. Padded, list Nov. 1, 89, 50
Scie Beams—See Beams, Scie	P. B. & W. Co... 60	Boardman & Son... 50	Electric Cutlery Co... Net
Scissors, Fluting... 45	Tinners', &c... 30	Miscellaneous	Stuffers or Fillers, Sausage—
Scrapers—	Snips, J. Mallinson & Co... 35	Holmes & Edwards Silver Co.	Miles "Challenge," \$ dos 3.00, 50
Adjustable Box scraper (S. R. & L. Co.) \$0.50... 30	Sheaves—	No. 67 Mexican Silver... 50	Perry... \$ dos, No. 1, \$1.00; No. 2, \$1.50
Box, 1 Handle... \$ dos \$4.00, 10	Siding Door—	No. 80 Silver Metal... 50	Draw Out No. 4, each \$30.00... 30
Box, 2 Handle... \$ dos \$6.00, 10	M. W. Co., list July, 1888... 50	No. 24 German Silver... 50	Enterprise Mfg. Co... 30
DeLancey Box and Ship... 30	R. & E. list Dec. 18, 1885... 50	No. 49 Nickel Silver... 50	Silvers... 40
Foot... 50	Corbin's list... 50	Wm. Rogers Mfg. Co... 50	Sweepers, Carpet and Lawn—
Ship, Common... \$ dos \$3.50 net	Patent Roller... 70	Rogers Silver Metal... 50	Carpet... \$ dos 17.00
Ship, R. I. Tool Co... 10	Russell's Anti-Friction, list Dec. 18, 1885... 50	125 Rogers' German Silver... 50	Rissell No. 2... \$ dos 120.00
Screen Window and Door	Reading list... 60	225 Rogers' Nickel Silver... 50	Rissell, Grand... \$ dos 35.00
Screen Drivers—See Drivers, Screen	Shells—	German Silver... 50	Stand rd... \$ dos 35.00
Bench and Hand—	First quality 4, 8, 10 and 12 gauge... 30	German Silver, Hall & Hilton... 50	Domestic... \$ dos 121.00
Bench, Iron... 55	First quality, 14, 16 and 20 gauge... 30	Nickel Silver... 50	Domestic, No. 2... \$ dos 122.00
Bench, Wood, Beech... \$ dos 12.50	Prise... 40	Britannia... 60	Grand Rapids... \$ dos 135.00
Bench, Wood, Hickory... \$ dos 12.50	Star, Club, Rival and Climax brands... 35	Boardman's Nck'l Silver, list July 1, 1891... 60	Crown Jewel, No. 2... \$ dos 130.00
Hand, Wood... \$ dos 12.50	Seibold's Comb. Shot Shells... 15	Boardman's Britannia Spoons, case lots... 60	Magie... \$ dos 15.00
Hand, Grand Rapids, list... 5	Brass Shot Shells, Club, Rival, Climax... 55	Carriage, Wagon, &c.—	Improved Parlor Queen... \$ dos 127.00
Leg, Hunt Point, list Jan. 1, 1890, 75 to 100	Shells Loaded—	Elliptic, Concord, Platform and Ralt... 60	Nickleed... \$ dos 124.00
Coach and Lag. Gimlet Point, list Jan. 1, 1890... 75	Standard list, July 1, 1890... 40	Roll... 60	Excelior... \$ dos 118.00
Bed... 35	Ship Tools—	Cliff's Bolster Springs... 35	Garland... \$ dos 118.00
Hand Rail, Sargent's... 60	L. & J. J. White... 30	Squares—	Parlor Queen... \$ dos 124.00
Hand Rail, H. & P. Mfg. Co... 60	Shoes, Horse, Mule, &c.—	Steel and Iron... 80	Housewife's Delight... \$ dos 115.00
Hand Rail, Am. Screw Co... 75	Horse—	Nickle-Plated... 80	Queen, with band... \$ dos 116.00
Jack Screws, Millers Falls list... 50	Burden's, Perkins', Phoenix and Bryden's Bost. at factory... 40	Try Square and T Bevels... 60	King... \$ dos 120.00
Jack Screws, P. S. & W... 35	Bryden's Frog Pressure, at factory... 35	Diston's Try Square and T Bevels... 50	Ladies' Improved... \$ dos 118.00
Jack Screws, Sargent... 60	Add \$1 per keg to above prices.	Winterbottom's Try and Miter... 80	Hub... \$ dos 118.00
Jack Screws, Stearns... 40	Co, Wrought—	Starrett's Micrometer Caliper Squares... 25	Cog-Wheel... \$ dos 118.00
Humason & Beckley Mfg. Co... 50	Ton lots... \$ dos 9	Avery's Flush Bevel Squares... 25	Easy... \$ dos 122.00
Williamson's... 35	1000 b lots... \$ dos 9	Avery's Bevel Protractor... 60	Monarch... \$ dos 122.00
Howe Bros & Hulbert... 35	500 b lots... \$ dos 9	Squeezers.	Goshen... \$ dos 121.00
Machine—	Shot—	Fodder—	Ladies' Friend... \$ dos 115.00
Flat Head, Iron... 55	Drop, up to B, 25-b bag... \$1.40	Blair's... \$ dos 2.00	Advance... \$ dos 118.00
Round Head, Iron... 50	Drop, up to B, 5-b bag... .35	Blair's "Climax"... \$ dos 1.25	Supreme... \$ dos 122.00
Wood—	Drop, B and larger, 25-b bag... 1.65	Lemon—	Thompson Mfg. Co... 30
List January 1, 1891.	Drop, B and larger 6-b bag... .40	Porcelain Lined, No. 1... \$ dos 30.00	
Flat Head Iron... 70	Drop, B and larger 6-b bag... .40	Wood, No. 2... \$ dos 30.00	
Round Head Iron... 65	Drop, B and larger 6-b bag... .40	Common... \$ dos 31.70	
Flat Head Brass... 70	Drop, B and larger 6-b bag... .40	Dunlap's Improved... \$ dos 33.75	
Round Head Brass... 65	Drop, B and larger 6-b bag... .40	Sammis... No. 1, \$5.00; No. 2, \$3.12	
Flat Head Bronze... 70	Dust Shot, 25-b bag... 2.00	Jennings' Star... \$ dos 32.50	
Round Head Bronze... 65	Dust Shot, 6-b bag... .45	The Boss... \$ dos 32.50	
Borer's Drive Screws... 35	Shovels and Spades—	Dean's, No. 1, \$ dos 35.50; No. 2, \$1.50; Queen, \$2.50	
Merrell Haws—See Saws, Scroll.	Ames' Shovels, Spades, &c., list Nov. 1, 1885... 30	Little Giant... 50	
Scythes—	Ames' Shovels frequently give 5% extra on above.	Hotchkiss Straight Flash... \$ dos 12.00	
Scythe Sashes—See Sashes, Scythe	Griffith's Black Iron... 50	Silver & Co., Glass... \$ gro. 40.00	
Awl and Tool.	Griffith's C. S... 60	Manny Lemon Juice Extractor... \$ dos 0.75 to \$1.00	
Atkins' Seta, Awls and tools... 55	Griffith's Solid C. S. R. H. Goods... 30	Improved... \$ dos 1.00	
No. 30, \$ dos 10.00... 55	Hubbard & Co... 30	Standard Fiber Ware—See Ware.	
Pray's Adj. Tool Hdl., No. 1, \$12.25; No. 2, \$12.40... 25	Lehigh Mfg. Co... 30	Standard Fiber.	
Miller's Falls Adj. Tool Hdl., No. 1, \$12.25; No. 2, \$12.40... 25	H. M. Myers Co... 30	Staples.	
Henry's Combination Haft... \$ dos 3.00	Payne Pettibone & Son... 30	Blind—	
Stanley's Excelior... 30	Hemington's Lowman's Pat... 30	Barbed, 1/2 in. and larger... \$ dos 7.00	
No. 1, \$7.50; No. 2, \$4.00; No. 3, \$5.50... 30	Rowland's Black Iron... 30	Barbed, 1/2 in. and larger... \$ dos 7.00	
Common Grad Seta... 30	Terra Haute Shovel and Tool Co... 30	Fence Staples, Galvanised... Same price	
No. 42, \$10.50; No. 43, \$12.50... 70	Shovels and Tongs—	Fence Staples, Plain... See Trd. Rep.	
Noti—	Iron Head... 50	Steelyards... 40	
Square... \$ gr. \$4.00 to \$4.25	Brass Head... 50	Stocks and Dies—	
Round... \$ gr. \$3.25	Staves—	Blacksmith's	
Buck Bros... 35	Mann's Tin Rim... 50	Waterford Goods... 35	
Cannon's Diamond Point... \$ gr. \$12.30	Buffalo Metallic, S. S. & Co... 50	Butterfield's Goods... 35	
Bisel.	Shaker (Barley's Pat.) Flour Sifters... \$ dos 22.00; \$ gr 21.00		
Regular list... 50	Electric... \$ gr 21.00		
Stillman's Genuine... \$ dos \$5.00 to \$7.75	Hunter's... \$ dos 2.00		
Stillman's Pattern, Hand, \$ dos 3.25	Shoes, Wooden Rim... 30		
Cross Cut, 6.25... 45	Mesh 18, Nested, \$ dos... 1.00		
Common Lever... \$ dos 22.00, 45	Mesh 20, Nested, \$ dos... 1.10		
Morrill's No. 1, \$12.00... 40	Mesh 24, Nested, \$ dos... 1.15		
No. 11, \$7.50... 40	Skelsin, Thimble—		
No. 8 and 4, \$18.00... 40	Western list... 75		
No. 6, \$24.00... 40	Columbus Wrt. Steel, Special net prices		
Leach's... No. 9, \$5.00; No. 1, \$15.00... 40	Coldbrookdale Iron Co... 60		
Leach's... No. 1, \$15.00... 40	Seneca Falls Pattern... 60		
Hammer, Hotchkiss... \$5.50, 10			
Hammer, Bents & Call Co.'s new Pat... 30			
Bemis & Call Co.'s Lever and Spring Hammer... 30			
Bemis & Call Co.'s Plate... 10			
Bemis & Call Co.'s Cross Cut... 10			
Atkins' Genuine... \$13.00, 50			
Atkins' Imitation... \$7.00, 50			
Hart's Pat. Lever... 20			
Hunter's Star... 25			
Leopold... 40			
Atkins' Lever... \$ dos No. 1, \$5.00			
Atkins' Criterion... \$ dos No. 1, \$6.00			
Croissant (Keller), No. 1, \$15.00; No. 2, \$34.00... 40			
Avery's Saw Set and Punch... 50			
Chieftain Co.'s Superior... \$ dos 7.00			
Chieftain Co.'s Royal... \$ dos 7.50			
Crescent... \$ dos 25.00			
Lloyd's Acme... \$ dos 15.00, 40			

